

**RECORDS CODE SHEET**  
SNR 4535 (Rev. 1-62)

**NAVAL AVIATION SAFETY CENTER**

**GENERAL (Card No. 1)**

**SUPPLEMENTARY (Card No. 2)**

Bureau Number	148426	16-21	Weather				16-21
Reporting Custodian	141	22-24	Kind of Flight			1A6	22-24
Type of Duty	21	25-26	Relative Wind - Direction			X	25
Major Command	2	27	Relative Wind - Velocity			6	26
Aircraft Damage	B	28	Relative Wind (Old Code - Not in Use)				27
Aircraft Injury	E	29	Clearance			2	28
Maneuver prior to Accident	R	30	Time of Day			2	29
First Accident type	L1	31-32	Number of other Aircraft				30
First Accident phase	52B	33-35	Altitude of Occurrence				33-35
Second Accident type		36-37	Contributing Cause Factors			46	36-37
Second Accident phase		38-40	Pilot Factor			XO	38-39
Type of Operation	23	41-42	Other Personnel Factor				41-42
Contributing Cause Factors	3	43-47	Major Material Factor			6	43
Pilot Factor, First		48-49	Design			6	44
Pilot Factor, Second		50-51	Facilities				45
Pilot Factor, Third		52-53	Weather				46
First other Personnel Factor		54-55	Non-Navy Injury ("R")				47
Second other Personnel Factor		56-57	Number of "A" or "L" or "M" injury				48-49
Primary Major Material Factor	L	58	Number of "B" Injury				50-51
Secondary Major Material Factor		59	Number of "C" Injury				52-53
Design		60	Number of "D" Injury				54-55
Facilities		61	Number of "E" Injury			61	56-57
Special Data & Cond.		62-68	Location			1/E1CVAS9	62-68
Type of Flight Hazard		69	Facility Data				69-74
Pri. Cause/Avoidable Inc. or Fit Hes or Br Actn	3	70	ACCIDENT DAMAGE	B	Don't Count	Enemy Action	Other Aircraft
Causal Fac for Pri-Cause	6	71-72			I.D. NO.	30121103	
Carrier Hull Number	59	73-74			YR MO	1 2 3 4 5 6 7 8 DAY TYR SEQ	
No Personnel Card ("R")		80	ACCIDENT INJURY	E		-F43	
			FISCAL YEAR	3		11 12 13 14 15 Model	

IBM: The above Fields are to be punched in all Coded Code

Model Code

13  
76 77

**PERSONNEL STATISTICS**  
(Card No. 3)

File Number	(b) (6)	Rank/Rate	Service	Age	Yrs Experience	Status	Position	Inj to Ind	Absolute A/C	Flight Logon	Training Utilization	Instl. Card	Total Time All Models	All Models 3 Months	All Series This Model	All Ser Ind 3 Months	CV Landings	Instrument Hours	Mile Hours	Total Time
Name	16 17 18 19 20 21																			
63 (b) (6)	(b) (6)	4	1	9	6	A	1	E	1	2	15	216	45	31	105	A	14	0899	99	
		22 23 24 25 26 27 28 29 30 31		32 33 34 35 36 37 38 39 40 41	42 43 44 45 46 47 48 49 50 51															
64																				
Name	16 17 18 19 20 21																			
File Number																				

IBM: PERSONNEL CODED ON REVERSE SIDE

CODE SHEET REVIEWED BY CLASS DESK ANALYST \_\_\_\_\_ (Initials) \_\_\_\_\_ (Date) \_\_\_\_\_ /62-7-62

CODE SHEET REVIEWED BY CLASS DESK ANALYST \_\_\_\_\_ (Initials) \_\_\_\_\_ (Date) \_\_\_\_\_ /62-7-62

A & R DEPARTMENT NARRATIVE CODE SHEET

YEAR	MONTH	DAY	TYPE	NUMBER	DAMAGE	INJURY	MODEL							
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
3	1	2	1	1	0	3	B	E	-	F	4	3		

BUREAU NUMBER

1	4	8	4	2	6
---	---	---	---	---	---

75	76	77	78
3	1	3	6

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 79

CLPS SM LG N/CN Ldg A/c SETTLE S/TK JAS P SITE BRACE FAIL

PREPARED BY J M. J. S. SMY R&S LOG CLERK 10

PUNCHED

PP

VERIFIED

D

24 JAN 1963

NARRATIVE BRIEF

16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 79 80

D/F Lens final appr hi at ramp A/c T/D APPROX 143 KTS  
 NORM RATE DESCENT ENGAGE #3 WIRE. STBD GR CLPS AFT 174  
 FT RUN OUT. A/c SETTLED ON STBD EXT TANK. PWD MATL F.  
 R/L SIDE BRACE LWR END FITNG PIN 32-416131-1 OKN THRU E/ 24  
 EYE. CAUSE FATIGUE FALL OF SIDE BRACE FM KNOWN PREV  
 HARD LNDGS.

PUNCHED 01 07 MAR 1963

VERIFIED

D

U. S. NAVAL AVIATION SAFETY CENTER  
U. S. NAVAL AIR STATION  
NORFOLK 11, VIRGINIA

NASC:116:jh  
Ser: 1382  
8 July 1963

SPECIAL HANDLING REQUIRED IAW OPNAVINST P3750.6 SERIES

From: Commander, U. S. Naval Aviation Safety Center  
To: Commanding Officer, Fighter Squadron SEVENTY FOUR  
Subj: VF-74 AAR ser 1-63 concerning F-4B (F4H-1) BuNo 148426 Accident  
occurring 21 January 1963, pilot (b) (6)

1. The subject report and all endorsements thereon have been reviewed. The Naval Aviation Safety Center concurs with the comments and recommendations of the Aircraft Accident Board as modified by subsequent endorsers.
2. The cause of this accident has been recorded by the Center indicating material failure (landing gear) as the single contributing factor.

(b) (6)

By direction

Copy to:  
BUWEPS (F-12) (2)  
COMSIXTHFLT  
COMSECONDFLT  
COMNAVAIRPAC  
CG FMFLANT  
COMFAIRMED  
COMFAIRNORVA/COMMABS 4&5  
CONCARDIV-4  
CG 2D MAW  
COMNAVAIRTESTCEN  
CO, USS FORRESTAL (CVA-59)  
CONCVG-8  
BUWEPSREP ST. LOUIS  
CO, VF-41, 96, 101, 102, 114, 121, 143  
CO, VMF(AW)-314, 531  
CO, VX-4  
NLO DIG/DAS NORTON AFB  
COMNAVAIRLANT

3

CNAL 30SL  
Seq: 2331  
18 MAR 1963

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH PARA 70, OPNAVINST 3750.6D

FIFTH ENDORSEMENT on VF-74 AAR ser 1-63, F-4B, 148426, accident occurring 21 January 1963, pilot (b) (6)

From: Commander Naval Air Force, U.S. Atlantic Fleet  
To: Commander, U.S. Naval Aviation Safety Center

Subj: Aircraft Accident Report

Ref: (a) ADMIN COMNAVAIRPAC message 090151Z March 1963 (NOTAL)

1. Forwarded, concurring in the comments and recommendations of the Aircraft Accident Board as modified by subsequent endorsers.
2. In an effort to prevent a recurrence of this type accident, Commander Naval Air Force, U.S. Atlantic Fleet directed that all rod eye ends be inspected. No positive findings have been reported. (b) (5)

(b) (5)

(b) (5)

These problems have been brought to the attention of Chief, Bureau of Naval Weapons and the contractor and will be discussed during a forthcoming conference conducted by Chief, Bureau of Naval Weapons. This problem has been assigned a high priority and will be closely monitored by Commander Naval Air Force, U.S. Atlantic Fleet until it is resolved. Additionally, reference (a) indicated that an analysis of PLAT tapes of F-4B shipboard landings revealed severe wing bending and outboard displacement of the main landing gear on touchdown. These movements are apparently resulting in structural landing loads not previously recognized nor anticipated. Chief, Bureau of Naval Weapons has been requested to investigate and report on these findings.

(b) (5)

(b) (6)

By direction

Copy to:  
(See next page)

ORIGINAL

FB4:34:wfk  
3750  
Ser: 110  
27 February 1963

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH PARA 70,  
OPNAVINST 3750.6D

FOURTH ENDORSEMENT on VF-74 AAR 1-63 concerning F-4B,  
BUNO 148426, accident occurring 21 January 1963, Pilot (b) (6)

From: Commander Carrier Division FOUR  
To: Commander Naval Aviation Safety Center  
Via: Commander Naval Air Force, U. S. Atlantic Fleet  
Subj: VF-74 AAR 1-63

1. Forwarded, concurring with the comments and recommendations  
of the board.

*V.G. Lambert*  
V. G. LAMBERT  
Chief of Staff

Copy to:  
NAVSAFCEN (2)  
BUWEPS  
COMFAIRMED  
COMFAIR NORFOLK/COMNABS 4 & 5  
COMSIXTHFLT  
COMSECONDFLT  
COMNAVAIRPAC  
COMCVG-8  
BUWEPSREP ST. LOUIS  
FSLO D/FSR NORTON AFB., SAN BERNADINO, CALIF.  
OinC, VF-101 DET A  
VF-102, VF-41, VF-121, VF-114, VF-143, VF-96, VF-74  
VX-4  
VMF (AW)-531  
VMF (AW)-314  
CG 2MAW  
CG FMFLANT  
COMNATC

5

ORIGINAL

**ORIGINAL**

CVA59  
Code 04/3750  
Serial: 337  
**FEB 23 1963**

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH PARA 70, OPNAVINST 3750.6D

THIRD ENDORSEMENT of VF-74 Aircraft Accident 1-63 concerning F-4B, BUNO 148426, accident occurring 21 January 1963, Pilot (b) (6)

From: Commanding Officer, USS FORRESTAL (CVA-59)  
To: Commander, Naval Aviation Safety Center  
Via: (1) Commander, Carrier Division FOUR  
         (2) Commander, Naval Air Force, U.S. Atlantic Fleet  
  
Subj: VF-74 Aircraft Accident 1-63

1. Forwarded, concurring with the comments and recommendations of the Board and subsequent endorsers.



L. R. GEIS

Copy to:  
NAVSAFECEN (2)  
BUWEPS  
COMCARDIV FOUR  
COMFAIRMED  
COMFAIRNORFOLK/COMMABS 4&5  
COMSIXTHFLT  
COMSECONDFLT  
COMNAVAIRLANT  
COMNAVAIRPAC  
CVG-8  
BUWEPSREPSTL  
FSLO D/FSR MORTON AFB., SAN BERADINO, CALIF  
OinC, VF-101 DET A  
VF-102  
VF-41  
VF-121  
VF-114  
VF-143  
VF-96  
VK-4  
VMF(AW)-531  
VMF(AW)-314  
CG 3MAW  
CG FMPLANT  
COMMATC  
CO, VF-74

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH PARA 70, OPNAVINST 3750.6D

**ORIGINAL**

**ORIGINAL**

CVG-8  
23:JMZ:rhl  
3750  
Ser 39

15 FEB 1963

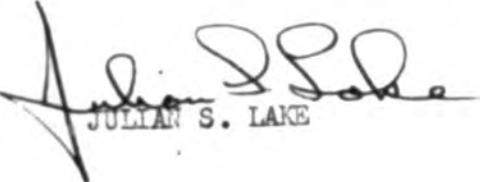
SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH PARA 70, OPNAVINST 3750.6D

SECOND ENDORSEMENT of VF-74 Aircraft Accident 1-63 concerning F-4E BUENO  
143426, accident occurring 21 January 1963, Pilot (b) (6)

From: Commander Carrier Air Group EIGHT  
To: Commander Naval Aviation Safety Center  
Via: (1) Commanding Officer, USS FORRESTAL (CVA-59)  
(2) Commander, Carrier Division FOUR  
(3) Commander, Naval Air Force, U.S. Atlantic Fleet

Subj: VF-74 Aircraft Accident 1-63

1. Forwarded, concurring with the comments and recommendations of the  
board and first endorser,

  
JULIAN S. LAKE

Copy to:

NAVSPECEN (2)  
BUWERS  
USS FORRESTAL (CVA-59)  
CONCARDIV FOUR  
CONFIRMED  
CONFIRMNFOIL/COMMABS 4&5  
COMSIXTHFLT  
COMSECONDFLT  
COMNAVAIRLANT  
COMNAVAIRPAC  
BUWEFSREPSTL  
PSLO D/FSR MORTON AFB., SAN BERADINO, CALIF  
OinC, VF-101 DET A  
VF-102  
VF-41  
VF-121  
VF-114  
VF-143  
VF-96  
VX-4  
VMF(AW)-531  
VMF(AW)-314  
CG 21AW  
CG FMFLANT  
COMMATC  
CO, VF-74

  
**ORIGINAL**

# ORIGINAL

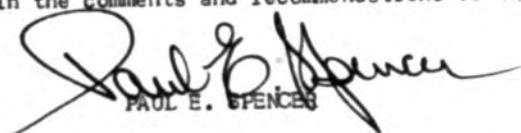
Code 00/cjc  
Ser: 59  
8 February 1963

FIRST ENDORSEMENT on VF-74 AAR 1-63 concerning F-4B, BuNo 148426,  
accident occurring 21 January 1963, Pilot (b) (6)

From: Commanding Officer, Fighter Squadron SEVENTY-FOUR  
To: Commander, Naval Aviation Safety Center  
Via: (1) Commander Carrier Air Group EIGHT  
     (2) Commanding Officer, USS FORRESTAL (CVA-59)  
     (3) Commander, Carrier Division FOUR  
     (4) Commander Naval Air Force, U. S. Atlantic Fleet

Subj: Aircraft Accident Report

1. Forwarded, concurring in the comments and recommendations of the Board.



PAUL E. SPENCER

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAVINST 3750.6

# ORIGINAL

# ORIGINAL

**AIRCRAFT ACCIDENT REPORT**  
 OPNAV FORM 3750-1 (Rev. 5-58) PAGE 1

**SPECIAL HANDLING REQUIRED In accordance**  
 with Para 65 OPNAV INSTRUCTION 3750.6D

OPNAV REPORT 3750-1

**PART I - GENERAL**

1 A/C ACCIDENT BOARD APPOINTED BY Commanding Officer, FITRON 74		2. DATE OF ACCIDENT 21 JAN 1963	TIME (ZT) 1637 A	3. SERIAL NUMBER 1-63
4. Commander, U. S. Naval Aviation TO: Safety Center		5. ENCLOSURES: (1)  <input type="checkbox"/> SEE		
6. VIA (1) Commanding Officer, FITRON 74 (2) Commander, Carrier Air Group 6 (3) Commanding Officer, USS FORRESTAL (4) Commander, Carrier Division 4 (5) Commander, Naval Air Force, Atlantic		6. ATTACHED  <input type="checkbox"/> SHEET		
		7. REPORTING CUSTODIAN (if different than item 2, above)	8. ACTIVITY OPERATING A/C (if different than item 7, above)	
9. MODE OF FL. GHT 1A6	10. TIME OF DAY <input type="checkbox"/> DAWN <input checked="" type="checkbox"/> DAY <input type="checkbox"/> DUSK <input type="checkbox"/> NIGHT	11. LOCATION OF ACCIDENT Mediterranean Sea	12. ELEVATION ABOVE SEA Flight Deck	
13. PLACE OF LAST TAKE-OFF USS FORRESTAL (CVA-59)		14. CLEARED: FROM CVA-59 to CVA-59		
15. TYPE CLEARANCE <input type="checkbox"/> FB <input checked="" type="checkbox"/> VFR <input type="checkbox"/> DVFR <input checked="" type="checkbox"/> LOCAL <input type="checkbox"/> OPERATIONAL <input type="checkbox"/> AIRWAYS <input type="checkbox"/> DIRECT <input type="checkbox"/> OTHER Special				
16. TIME IN FLIGHT 1.6	17. TYPE ACCIDENT Main landing gear L-1 collapse	18. FLAME OF FLIGHT Carrier landing 5 (FRESNEL LENS)		
19. MODEL A/C F-4B	20. SERIAL NO. 148426	21. DAMAGE TO A/C <input type="checkbox"/> A <input checked="" type="checkbox"/> B <input type="checkbox"/> C <input type="checkbox"/> D <input type="checkbox"/> E <input type="checkbox"/> F	22. DOLLAR COST Less than \$40.00	23. AIRMAN HOURS 6635.000 140 hrs 140 min 134,000 lbs.
25. LIST MODEL, SER NR, REPORTING CUSTODIAN AND DAMAGE CLASSIFICATION OF ANY OTHER A/C INVOLVED (Complete if applicable) See para 65 OPNAV 3750-1 for code, etc. NONE				
1. NAME (last, first and middle initials) (PILOT INSTRUMENTS AS TIME OF ACCIDENT) (b) (6)		2. RANK RATE LT	3. FILE SER. NO. (b) (6)	4. DECODE NAME 1310 USN (b) (6)
		5. BRANCH OF SERVICE 6. AGE 6	7. VIG. OF EXPER. 8. BILLET IN POSITION Pilot Cockpit E	8. VIG. OF EXPER. 9. POSITION RIO Rear E
PERSONNEL		10. UNIT TO WHICH PERSONNEL ARE ATTACHED FITRON 74	11. TYPE INSTRUMENT CARD <input checked="" type="checkbox"/> STANDARD <input type="checkbox"/> SPECIAL	
PILOT	YES <input checked="" type="checkbox"/> X <input type="checkbox"/> X X X			
RIO	NO			
(b) (6)	YES NA NA NA NA			
	NO			
12. ITEM		13. PILOT RIO	14. ITEM	15. PILOT RIO
ALL MODELS		1625 1169	CV LANDINGS DAY/NIGHT 5-4B 66/21 148/46 NA	
ALL MODELS IN LAST 12 MONTHS		195 242	FLCP LANDINGS DAY/NIGHT 480/155 NA	
ALL MODELS IN LAST 3 MONTHS		57 64	INSTRUMENT HOURS LAST 3 MONTHS 14 NA	
ALL SERIES THIS MODEL (b) (6)		A/C 313 407	NIGHT HOURS LAST 3 MONTHS 0 NA	
OPT / OPT		15/5 NA		
ALL SERIES THIS MODEL LAST 12 MONTHS		A/C 180 235	TOTAL HELD HRS. (b) (6) NA	
OPT / OPT		15/3 NA	TOTAL JET HOURS (b) (6) 1370 NA	
ALL SERIES THIS MODEL LAST 3 MONTHS		A/C 57 64	LAST FLIGHT, ALL SERIES THIS MODEL DATE 1-11-63 1-11-63 ROUTE 2.0 2.0	
OPT / OPT		0/0 NA		
13. NAME (last, first and middle initials)		DRM RATE 1 2 3 4 5	FILE/SERVICE NO.	16. DRG. TO WHICH ATTACHED 17. INSTRUMENT CODE 18. BILLET POSITION
1				
2				
3				
4				
5				

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAVINST 3750.6

9

## AIRCRAFT ACCIDENT REPORT

PAGE 2

1. CEILING E70 FT	2. VISIBILITY 8	3. WIND DIRECTION & VELOCITY (relative) 000/35	4. TEMPERATURE 50	OUTSIDE AIR NA	RUNWAY NA	5. DEW POINT 36	6. ALTIMETER SETTING 29.74
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7. OTHER WEATHER CONDITIONS (winds shift, icing levels, sea state, etc. if pertinent to accident)

35 SCAT (Light Sea) State 2

✓	FACTOR	✓	FACTOR	✓	FACTOR
	PILOT		LANDING SIGNAL OFFICER	X	MATERIAL FAILURE OR MALFUNCTION
	CREW		OTHER PERSONNEL (Specify)		DESIGN
	SUPERVISORY PERSONNEL		ADMINISTRATIVE		ROLLING AND PITCHING DECK/ ROUGH SEAS
	MAINTENANCE PERSONNEL		AIRPORT OR CARRIER FACILITIES	X	UNDETERMINED
	SERVICING PERSONNEL		WEATHER		OTHER (Specify)

## FOR ACCIDENTS ABOARD DEPLOYED CARRIER (Complete following Section on Page 2)

1. DATE DEPLOYED 3 August 1962	2. DAY - HOURS/LANDINGS LOGGED SINCE DEPLOYED 102 HRS/56 LDGS	3. DAY - HOURS/LANDINGS LOGGED LAST 30 DAYS 16 HRS/9 LDGS
4. INSTRUMENT HRS. LOGGED SINCE DEPLOYMENT 27 HRS	5. NIGHT - HOURS/LANDINGS LOGGED SINCE DEPLOYED 16 HRS/13 LDGS	6. NIGHT - HOURS/LANDINGS LOGGED LAST 30 DAYS 2 HRS/2 LDGS

## PART II - MAINTENANCE, MATERIAL AND FACILITIES DATA

1. A/C HISTORY	DATE OF MANUFACTURE	SERVICE TOUR	MONTHS IN THIS TOUR	TOTAL NO. OF OVERHAULS	FLIGHT HRS. SINCE LAST OVERHAUL	FLIGHT HRS. SINCE ACCEPTANCE	TYPE CHECK LAST PERFORMED	FLIGHT HOURS SINCE LAST CHECK	NO. OF DAYS SINCE LAST PERIOD
1 Dec 1961	1	13	0	NA	304	3rd CAI.	7.6	7.6	10
	ENGINE MODEL	ENGINE SERIAL NO.							
1	13 Dec 60	J79GE-8	401146	1	7.6	213	Accept X	7.6	10
2	27 Jun 62	J79GE-8	401801	0	NA	21.6	Accept X	7.6	10
3									
4									

5. DID FIRE OCCUR? <input type="checkbox"/> BEFORE ACCIDENT <input type="checkbox"/> AFTER ACCIDENT <input checked="" type="checkbox"/> DID NOT OCCUR	6. DID EXPLOSION OCCUR IN FLIGHT? <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO
--	--

7. CHECK IF APPLICABLE <input checked="" type="checkbox"/> BEFORE ACCIDENT <input checked="" type="checkbox"/> AFTER ACCIDENT <input checked="" type="checkbox"/> AFTER SERIAL 203-63	8. HAS DIR BEEN REQUESTED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	9. FAILED COMPONENT INVOLVED R/H Main Landing Gear
---	---	---

## CHECK ITEMS PRESENT IN THIS ACCIDENT:

a. <input checked="" type="checkbox"/> A/C DESIGN	d. <input checked="" type="checkbox"/> UNDETERMINED	e. <input type="checkbox"/> SURFACE FACILITIES
b. <input type="checkbox"/> A/C EQUIPMENT	f. <input type="checkbox"/> TECHNICAL INSTRUCTION	g. <input type="checkbox"/> HUMAN ENGINEERING (e.g. Cockpit configuration, etc.)
c. <input type="checkbox"/> MAINTENANCE	i. <input type="checkbox"/> OTHER (Specify)	

a. ALTITUDE AT MALFUNCTION Flight Deck	b. AIR SPEED 140-145	c. OPERATING TEMP. NORMAL	d. WEIGHT OF A/C 34,200	e. G.C. (S/A/G) 31.5	f. KIND OF FUEL JP-5	g. FUEL PRESSURE NORMAL
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a. EVIDENCE OF FUEL CONTAMINATION NA	b. CAUSE OF ENGINE FAILURE OR FLAME OUT NA	c. FUEL CONTROL REGULATOR/CARBURETOR (List deck and Ser. no., give time since last op. if applicable) NA	d. FUEL SYSTEM AS RECEIVED Wing tanks LAV-17A No. 1000-1000-1000
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(If additional space is necessary, attach additional sheet)

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAVINST 3750.6

10



PART V - THE ACCIDENT

1. LT (b) (6) and his Radar Intercept Officer (RIO), LT (b) (6), launched in F-4B BuNo 148426 at 1459A from USS FORRESTAL (CVA-59), operating in the Mediterranean Sea. The flight was scheduled as airbone Competitive Exercise Observer for Fighter Squadron ONE HUNDRED THREE. The flight was routine in all respects and the pilot returned to the ship to meet a 1650A "Charlie" time. He flew a normal VFR pattern, breaking his flight to take interval on a preceding flight of F-8C airplanes. The landing approach progressed normally until the LSO initiated a "foul deck" wave-off. This was also a "heavy" wave-off.
2. The second approach was started with a slightly steep turn into the groove. Called "fast" in the groove, the pilot corrected properly and continued his approach. Slightly high at the ramp, the airplane landed engaging No. 3 crossdeck pendant. On touchdown puffs of white smoke emitted from the area of the R/H wheel.
3. The arrestment appeared normal in all respects until near the end of runout when the R/H main landing gear collapsed and the airplane settled on its R/H external drop tank (enclosures (1) through (11)). The airplane did not swerve and stopped slightly left of centerline. The pilot secured the engines, and he and his RIO evacuated the airplane. They were examined immediately by the reporting Flight Surgeon. No injuries were received by either aircrewmen (enclosure (22) Medical Officer's Report - Original only).
4. The airplane was cleared from the landing area by flight deck personnel within 10 to 12 minutes with no further damage.

Recd copy

Recd

PART VI - DAMAGE TO THE AIRPLANE

1. F-4B BuNo 148426 sustained overheat (Bravo) damage when the R/H main landing gear (MLG) collapsed and the airplane settled on the R/H external drop tank during arrestment.
2. The R/H side brace lower end fitting (P/N 32-41613-1) was broken in half through the eye (enclosures (12) (13) and (14)). The R/H MLG was broken off at the aft trunnion (P/N 32-41626-4) just forward of the attach point for the aft drag brace cylinder (enclosure (15)).
3. The R/H center section main spar (P/N 32-11011-310) was cracked around the upper edge of the forward trunnion bearing boss (enclosure (16)) when the forward trunnion was forced out of the bearing (P/U BSN 30070) exerting an excessive load on the bearing retainer (P/N RRT 2680). The crack runs from the under cut groove for the lock ring to the outer face of the boss, 3/8 inch above the periphery of the hole for the bearing, for 120 degrees around the circumference.
4. The face of the aft bearing support for the MLG trunnion was chipped (enclosure (17)). The chip was 3/4 inch in diameter tapering in depth from the face to a maximum of 1/16 inch at the hole. The drag brace actuator and shrink link were both damaged (enclosure (18)).
5. When the airplane came to rest the MLG was pinned under the R/H external drop tank with the wheel facing up. The drop tank had been pushed outboard and was torn loose from the pylon assembly, rotating almost 90 degrees from its normal position. The split line attachment along the side of the tank gashed the center section leading edge flap when the airplane settled on the tank at the end of arrestment.
6. The R/H trailing edge flap was damaged when the airplane settled to the flight deck during the last few feet of arrestment. The trailing edge honeycomb section was curled up for approximately six inches.
7. An itemized list of replaceable and repairable parts is shown in enclosure (19).

13

PART VII - THE INVESTIGATION

1. The crew was on an authorized scheduled flight. Both aircrew members were physically qualified and aeronomically adapted for the assigned flight. The pilot is an experienced carrier aviator with 313 hours and 83 arrested landings in model (enclosure (20)).
2. The airplane had been properly serviced and was ready for flight (enclosure (21)).
3. The approach, touchdown, arrestment and mishap were observed by several qualified LSO's, squadron aviators and other personnel. Many witnesses were interviewed and pertinent statements obtained for inclusion in the report (enclosure (3) through (10)). Primary credence was given to the observations of those witnesses carrier qualified or LSO qualified, or both, in the model airplane involved.
4. The pilot stated that the landing gear indicated down and locked. The witnesses concurred that the landing gear appeared down and locked (enclosure (11)).
5. Unfortunately, on the recovery during which the mishap occurred, the Pilot Landing Aid Television (PLAT) installation was out of calibration. The glide slope, instead of being in the vicinity of the cross hairs, was oriented one fifth the distance from the bottom of the viewing screen (enclosure (11)). Review of the tape substantiated witnesses' observations that the airplane was slightly fast on final. Approach geometry of the F-4B in the Power Approach (PA) configuration is such that at optimum angle of attack, the dual nose tires are superimposed on the engine auxiliary air doors. Evaluation of total glide path of the airplane was not practical due to the disoriented view. However, qualitative evaluation of the touchdown rate of descent did not indicate an unusually high sink rate for the model. Witnesses observations varied, but tended to support the fact that it was not a hard landing. None of the tires were blown or scarred, nor were there any other structural deficiencies that are usually manifest in an F-4B subsequent to a hard landing.
6. The pilot was observed to make a power reduction crossing the ramp. An airplane is flown to touchdown when making a carrier landing. This includes power corrections of small magnitude, particularly when in close. Power corrections are very effective in maneuvering the F-4B on glide slope due to the superb engine response of the J-79-8 (e.g., 3 seconds from approach power to military in Power Approach (PA) configuration).
7. During most of the approach, the airplane was in a fairly steady state left side/slip (approximately 3 degrees right yaw and 5 degrees left wing down). On final, the airplane was crossing right to left and landed left of centerline, left gear first. At touchdown the airplane rocked onto the right gear and disappeared from view of the centerline viewer. Transition to the side view PLAT camera shows the gradual collapse of the airplane onto the drop tank during runout. The airplane touched down about 11 feet aft of No. 4 wire, engaged No. 3 crossdeck pendar, did not swerve during arrestment, and stopped still 5 feet left of centerline.
8. The airplane's Gross Weight was approximately 34,200 lbs. The maximum landing weight for the airplane is 34,000 lbs, but the overweight percentage is not considered a significant factor (0.57% of maximum landing Gross Weight or 4.25% of maximum landing fuel weight of 4700 lbs).
9. The optimum approach speed at this Gross Weight is 141 KCAS with acceptable variations ranging from 139 to 143 KCAS (F-4B Flight Manual).

14

10. The SPN-12 reading was steady at 150 knots. Qualitatively, based on airplane approach geometry and characteristics, the SPN-12 readings have frequently been 5 to 8 knots higher than actual during the recent at-sea periods. Comparison with SPN-12 data accumulated during recent observations of day and night F-4B carrier landings indicates that the approach speed of BuNo 148426 was within normal operating tolerance (enclosure (23)).
11. Weather in the vicinity was VFR with 3500 scattered and estimated 7000 broken. Visibility was about 8 miles. The wind was steady with usual 3 to 5 knot variations. The sea state was light (2) with 4 foot waves. The deck was steady. Wind over the deck (WOD) was termed down the angle, but there appeared to be a right crosswind of small magnitude.
12. The Fresnel Lens Optical Landing System (L/H installation) was in use with proper F-4B settings being utilized (4 degrees basic angle and 9 degrees roll angle). The system operated satisfactorily during the recovery.
13. Arresting gear Gross Weight setting, WOD, engaging speed, runout, and ram travel were all well within normal operating tolerances.
14. The failed MLG and almost all other debris were found in the vicinity of the R/H main wheel well. The MLG was pinned beneath the drop tank with the wheel facing up.
15. Evaluation of flight deck markings (enclosure (24)) indicates that although the gear did not collapse immediately, it was not completely supported from touchdown throughout most of the excursion. The 3/H tire track shows that the MLG had some freedom of lateral movement and the tire described an erratic, sinusoid pattern on the flight deck. The puffs of white smoke (enclosure (11)) were caused by the tire veering in irregular pattern as it dragged assymmetrically. The tire marks were evident for 174 feet from touchdown.
16. The MLG side brace actuator end fitting failed at the eye in primarily a tension loading. The half of the eye which attaches to the MLG strut was the only debris not recovered.
17. Evidence of the broken end fitting of the side brace actuator being struck by the bearing of the MLG actuator attachment is apparent due to the bronze deposit on the upper half of the broken end fitting (enclosure (13)). Also on the upper half of the broken end fitting is some evidence of peening action where the surface is smooth and shiny indicating a crack may have previously existed. Close scrutiny failed to reveal any fatigue waves on the surface. Smaller portions of the upper half surface and the entire lower side surface (enclosure (14)) indicated instantaneous failure. Fracture surfaces on other MLG components (MLG aft trunnion and drag brace) also indicated instantaneous failure. It is recognized that the board's ability to evaluate such details is limited.
18. The failure of the side brace actuator was reported by VP-74 FLIGHT SAFETY AMPUR 203-63. The failed part was mailed to BUWEPSRMP ST LOUIS for laboratory analysis and the other components will follow.
19. A previous failure of the same part was reported by VMF(AW)-521 AAR 2-62 on F-4B BuNo 149471, an airplane with no reported hard landings.
20. The first failure most likely occurred in the side brace actuator lower end fitting at the eye. The MLG was then partially supported laterally, by the actuator (inboard) and the wing drop tank (outboard).

Longitudinal restraint was provided by the trunnions and drag brace fittings. The partial restraint allowed the gear to oscillate, leaving the asymmetrical, sinuous tire track. Eventually, the high energy level of the arrestment fractured the drag brace fittings, allowing the MLG to be wrenched completely from the trunnions after about 174 feet of runout. Its last movement before complete collapse was outward and aft. Trailing to the deck it became pinned under the drop tank. At 214 feet of runout the R/H flap TE contacted the deck leaving marks for approximately 8 feet until the airplane stopped.

21. Examination of the maintenance history of the airplane indicated that all applicable service changes were incorporated and pertinent technical directives were being complied with.

22. Review of the landing history of the airplane revealed five recorded hard carrier landings (enclosure (21)). By local definition a hard landing is one in which the pilot or LSO feels that the airplane encountered a landing sink rate sufficiently high to warrant an inspection. A hard landing inspection is described in enclosure (21).

23. Squadron experience with the F-4B shows that hard landings have resulted in blown MLG tires, cracked wheels and brake assemblies, blown or cut nose tires, stripping of engine mounting bolts, compression buckling of wing skin in the vicinity of the speed brake area, and dislocation of leading edge flap Boundary Layer Control seals.

24. In so far as local inspection capability exists, structural damage was found after two of the recorded hard landings.

25. The first hard landing occurred on 16 April 1962, following a R/H engine exhaust nozzle failure. On glide slope, the R/H engine was set at 92%, nozzle failed full OPEN. Near the ramp, nozzle authority returned, causing the airplane to accelerate rapidly, land hard, long and bolter. The subsequent landing was normal. The R/H brake assembly and all tires required replacement. Minor skin damage was evidenced in the vicinity of the R/H LE flaps and wing missile pylon.

26. On 21 June 1962 the airplane made a hard carrier landing with no discrepancy noted.

27. On 10 July 1962 the airplane made a hard carrier landing. Both main mounts had blown, the L/H engine had dropped 1/4 inch and a compression buckle developed on the underside of the L/H wing near the speed brake well. The airplane was inspected for structural integrity by P and E personnel from Cherry Point O and R and found fit for further use after squadron repair. A template was cut conforming to the compression buckle on the L/H wing to assist in evaluating future growth of the deformation.

28. On 18 August 1962, the airplane made a landing with full external drop tanks. No discrepancies were noted.

29. On 13 August 1962, the R/H main strut was found flat after a landing. It was repacked and performed satisfactorily. On preflight inspection 4 September 1962 during an import period the R/H strut was again found flat and repacked.

30. On 11 December 1962, the airplane made a hard carrier landing. No discrepancies were noted.

31. The deformation of the wing skin which occurred on the landing on 10 July 1962 has not increased in detectable magnitude.

16

32. Side brace actuator end eye fittings were ZYGLO inspected on all other squadron airplanes with negative findings.
33. NATOPS requirements or procedures were not factors in the accident. The NATOPS manual was being complied with and the accident does not indicate a possible need for a change to the F-4B manual.

## PART VIII - THE ANALYSIS

1. Analysis of events leading up to the mishap indicate that all of the personnel and flight deck hardware contributions necessary for a normal successful carrier landing were functioning properly.

### A. PERSONNEL FACTORS

1. The pilot is experienced and current in the model airplane and in performing the landing maneuver involved. There were no apparent physiological or psychological factors involved.

2. Pilot factor was considered during the course of the investigation, but was rejected after thorough analysis of the events.

3. The pilot did not demonstrate any radical maneuvers or dangerous tendencies during this approach. The approach on which the mishap occurred was an average pass from an LSO/pilot/ observer viewpoint. The day of the mishap was the first flying day for the squadron after 10 days in port. Interestingly enough, of the 10 F-4B aviators who flew that day there were 6 approaches graded in the same category as that on which the mishap occurred. Three did better and the last less satisfactory.

4. Considered individually, none of the relatively minor approach technique deficiencies described in the investigation would result in excessive landing loads. However, it is felt that the additive effect of these deficiencies in conjunction with suspected metal fatigue caused collapse of the MLG.

### B. MATERIAL FAILURE

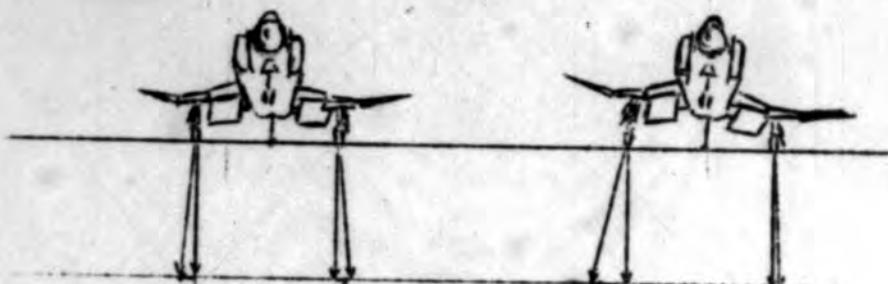
1. The pattern of failure which occurred points to the side brace actuator end eye fitting as being the first component to break. Failure was manifest immediately as shown by the R/H tire marks describing an erratic, sinuous path from the point of touchdown for 174 feet. Typical complete main landing gear failures from impact shock loads usually result in the entire assembly tearing loose and proceeding up the flight deck and over the side, in the general direction of airplane travel. The one missing piece of debris in this accident (lower end of the side brace actuator eye fitting) is suspected to have failed at touchdown - and most likely went over the side.

2. The fact that this airplane had experienced five ~~hard~~ hard landings, two of which had attendant damage, is significant. The records do not indicate that a side brace actuator was ever changed. No damage being evident, there was no valid reason to replace the component. It is felt that the main landing gear collapse was the consequence of progressive metal fatigue of the side brace actuator and eye fitting - and that its failure was accelerated to some unknown extent by the landing side loads.

3. Characteristically, carrier landings are most frequently made in all models with the left mount touching first. The F-4B's main landing gear struts cant outboard a few degrees (i.e., 1/4 inch at 40,000 lbs Gross Weight) with weight on the gear. It would seem logical, then, that in normal left gear first touchdown that the R/H side brace actuator would feel a greater side load as the airplane rocks onto the right mount - than during a simultaneous touchdown. (See sketch on next page).

18

SKETCH DEPICTING INCREASED MLG SIDE LOADS DUE ROLL AND ROCK TOUCHDOWN



4. The landing under discussion provided the side loads required to render the fracture complete. The airplane landed in a left side slip which imposed a side vector force working against the R/H side brace actuator. This force was the result of the action of the R/H main mount dragging as it contacted the deck opposed to the direction of airplane travel. The previously discussed side vector force felt as the airplane rocked onto the R/H main mount after initially touching down left mount first added another side load. These additive side loads aggravated by the fact that the airplane was slightly fast, riding slightly high on glide slope and just very slightly left of center accelerated failure of the part which had been materially weakened by the recorded hard landings.
5. It appears obvious then that the criteria established for determining when and if a hard landing occurs is vague and inadequate. Present, available criteria for hard landings are by nature qualitative. There presently does not exist any immediate method for quantitative, rapid, assessment of landing loads - as determined by sink speed, yaw, roll, and pitch and the associated rates of yaw, roll and pitch.
6. As fleet operations become even more expanded with the incorporation of approach power compensators, and other semi or fully automated landing systems - under adverse environmental conditions, such as pitching decks and high winds, a greater need will be felt for monitoring landing loads.
7. The use of the GIANNINI statistical accelerometer (incorporated in BuNo 149 series and later) is not valid for recording landing loads. The instrumentation is designed to record airframe vertical accelerations only when the landing gear is up. When the gear is lowered or when electrical power is off, the system is inoperative. The system is also designed to record peak cyclic loads (e.g., on a 6G maneuver it will record 6G, and not the 4G and 5G levels). To do the latter would result in a false record of cycles.
8. Use of the cockpit accelerometer is also considered invalid. Instrument sensitivity varies from one installation to the next. Damping and inertia design is such that the instrument will either undershoot or overshoot. The indicator is designed to provide the pilot with a usable indication of vertical acceleration - not the combined instantaneous longitudinal and vertical loads of carrier landings. Its location is remote from the airplane center of gravity and high readings are not unusual following an in flight engagement or tail low landing aboard ship.

9. A rapid, reasonably accurate method of monitoring landing loads would be a touchdown rate of descent indication. Instrumentation to do the job is presently available at test activities. Facilities are needed aboard ship for measuring approximate sink speed at the instant the landing occurs to eliminate the guesswork in determining a hard landing.

10. Inspection requirements for hard landings are also in need of revision. A need has been demonstrated by the findings in this report for some re-evaluation of where and what damage to look for. It would be out of the question to render an opinion on design deficiency of the side brace actuator and fitting - taking into consideration the landing history of the airplane. There is justification however, for re-appraisal of F-4B landing gear structural landing load distribution during carrier landings.

PART IX - COMMENTS

1. The most probable cause of the accident was material failure of the R/H side brace actuator and eye fitting. The failure was most likely due to progressive weakening of the part from recorded hard landings.
2. The fact that despite rigorous inspection the failure was not recognized, demands re-appraisal of F-4B landing load distribution and where and what damage to anticipate subsequent to a hard landing.
3. The results of the investigation point out a definite requirement for quantitatively measuring sink speeds during carrier operations to more accurately determine when a hard landing occurs.

PART I - RECOMMENDATIONS

1. F-4B operating activities ZYGLO inspect side brace actuator and eye fittings following known hard landings to assist in determining the integrity of that part.
2. The contractor investigate the main landing gear load distribution with emphasis on the designed capability of the side brace actuators and the overall view of hard landing inspection requirements.
3. A system be developed to give fleet capability for instantaneous assessment of carrier landing sink speeds.

JJ

STATEMENT OF LT (b) (6)

/1310, USN, pilot, Concerning VF-74  
AAR 1-53 occurring 21 JAN 1963, F-4B, BUNO 148426, Pilot (b) (6)

I was the pilot of F-4B BUNO 148426, side number 103, for the 1500 launch from USS FORRESTAL (CVA-59) on 21 JAN 63. I was the flight leader and briefed the flight at 1345. The flight was to be as airborne observer for competitive exercises by VF-103.

At 1425 I was assigned aircraft number 103 by the SDO and the previous 10 yellow sheets were noted at this time. There were no previous discrepancies noted that would have indicated any trouble with the landing gear or airframe associated therewith. No hard landing discrepancies were noted from previous flights.

My RIO, LT (b) (6) and I manned the aircraft at 1430 and a normal exterior preflight was made by us both. Both wheel wells, landing gear, struts, etc., were checked with no discrepancies noted. The aircraft was spotted on the number one (1) catapult. It was noted that the starboard main mount had just been changed from the previous launch.

After turnup, normal pre-flight checks were made and at approximately 1455 the aircraft was taxied forward about 5-10 feet for tensioning. No abnormal airframe vibrations were noted. I was launched at 1500 and normal retraction of the gear and flaps was made without incident.

The hop proceeded as briefed and at approximately 1635 I returned in company with F-4B side number 107 for recovery. After break-up, gear and flaps were extended normally. The first pass I executed a waveoff due to heavy fuel state and foul deck. On the second pass, gear, flaps, hook were checked on the 180° position with my RIO. State at this time was 5000 lbs. indicated. A relatively steep turn was made into the groove and at this time I was indicating a fast chevron and donut on the angle of attack with the meat ball slightly high. Out of the turn the LSO called that I was fast, this was confirmed by the fast chevron and my RIO calling 145 kts, which correlated with my airspeed indicator. A high dip was taken followed by a power reduction. Crossing the ramp I indicated an on-speed donut and an estimated  $\frac{1}{2}$  to  $\frac{3}{4}$  meat ball high. The hook engaged the number 3 cross deck pendant and as rollout commenced I could feel the aircraft start to settle on the right wing. The arrestment did not feel hard or excessive in any way. After I had assured myself that the aircraft was stopped the engine was secured.

(b) (5)

I have a total of 1625 flight hours, 1370 in jets, and 313 hours in the F-4B. I have a total of 194 carrier landings of which 87 are in the F-4B. I was designated a Naval Aviator on 24 October 1956 and have been in a active flying status since that time.

(b) (6)

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (1)

23

STATEMENT OF LT [REDACTED] (b) (6) /1350, USN, RADAR INTERCEPT OFFICER,  
Concerning VF-74 AAR 1-63, F-4B, BU NO 148426, occurring 21 JAN 1963,  
Pilot [REDACTED] (b) (6)

On 21 JAN 1963, I was the RIO with LT [REDACTED] (b) (6) in Backwash 103. The mission was scheduled from 1500-1630 as observer for a VF-103 Compex. LT [REDACTED] (b) (6) was the flight leader and briefer. The briefing was complete and nothing abnormal was found on pre-flight. The catapult launch and mission were uneventful.

On return to the ship, we joined with BW107 and entered the break normally. To keep a proper pattern, our interval was too close and we got a foul deck wave off.

On our second approach, we had a short groove and I saw the ball come on the top of the lens and move to the center. The speed, when in the groove was 148 KCAS. The LSO called "a little fast" at which time I heard the power decrease and the speed drop to 140 KCAS.

The speed remained at 140 KCAS until touchdown. It is my habit to monitor airspeed and occasionally sight the meatball through out the approach. I last saw the meatball about the time we crossed the ramp. It was centered as it had been once on the glide slope.

The landing was not harder than normal although it felt like a tire had blown. I did not know the gear had collapsed until I opened the canopy after both engines were secured.

I have experienced over 100 carrier landings in the F-4B and the approach and touchdown were normal in all respects.

(b) (6)  
[REDACTED]

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (2)

STATEMENT OF LCDR (b) (6) [REDACTED] /1310, USN, Controlling LSO,  
Concerning VF-74 AAR 1-63 occurring 21 JAN 1963, F-4B BUNO 148426,  
Pilot (b) (6)

I was controlling LSO on the 1630 recovery. The wind was thirty-four knots down the angled deck; visibility was good, the sea relatively calm and there was no deck motion. A normal daylight recovery was in progress utilizing the Fresnel lens which was operating properly. F-4B, Backwash 103, was waved off on his first approach for a fouled deck. His second approach commenced with a little steep turn rolling into the groove. The aircraft then accelerated to moderately fast about 3000 feet aft. I called "you're fast" and proper correction was made, so that at the ramp Backwash 103's speed appeared normal, and his glide slope just very slightly high. His rate of descent to touchdown did not appear excessive. I graded the approach: "(OK) (STIG) FXG (HAR) on 3 wire." I considered this an average approach and not excessive in either airspeed or sink speed at the ramp. He did not drop the nose.

(b) (5), (b) (6)  
[REDACTED]

I was designated a Naval Aviator 13 October 1954 and have 2065 hours (1500 jet) and 207 carrier landings (201 jet). I have been qualified to control F-4B aircraft day and night on the ship since June 1962 and am currently qualified in all types assigned to CVG-8. I am presently assigned to VAH-5.

(b) (6)  
[REDACTED]

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (3)

STATEMENT OF LCDR [REDACTED] (b) (6) 1310, USN, Senior Air Group LSO,  
Concerning VF-74 AAR 1-63 occurring 21 JAN 1963, F-4B, BUNO 148426,  
Pilot [REDACTED] (b) (6)

At about 1636 I proceeded to the LSO platform for the last recovery of the day. I observed the first three or four F-8C and one F-4B landings. The second F-4B Backwash 103 was given a foul deck wave-off on his first approach. For the second approach of 103 I was standing directly behind the controlling LSO, LCDR (b) (VAH-3) in a position so I could observe SPN-12 and other dial settings. For the second approach I noted the wind to be 33 knots indicated (34 knots actual) down the angle deck. Basic angle setting was 4 degrees with a roll angle of 9° which is correct for the F-4B for the ship. Backwash 103 entered the groove with a slightly steep angle of bank and upon rolling wings level I noted that he looked slightly flat. I checked the SPN-12 reading to be 152 knots, but it had been reading about 8 knots high for the previous F-8C approaches. The aircraft's approach light was flicking from amber to red intermittently and finally changed to steady amber as he approached the ramp. His starting altitude in the groove appeared good but as he approached the ramp he was slightly high, but such that his hook would have touched down in the vicinity of number three or four wires. As he crossed the ramp I observed the right wing drop as if to make a last minute line-up correction and heard the power decrease. This increased the sink rate and 103 engaged number three cross deck pendant. At touchdown I heard a bang and thought at first that the starboard tire had blown, but the noise was considerably less than that normally accompanying a blowout. The aircraft appeared to settle slowly on the starboard drop tank during runout.

I have been a naval aviator since 1953 and an LSO since 1956. I have approximately 2020 hours of which 1400 are jet and 225 carrier landings.

(b) (6)  
[REDACTED]

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (A) 1

STATEMENT OF LT [REDACTED] (b) (6) /1310, USN, VF-74 LSO,  
Concerning VF-74 AAR 1-63 occurring 21 JAN 1963, F-4B, BUNO 148426,  
Pilot [REDACTED] (b) (6)

On 21 JAN when the starboard gear collapsed on Backwash 103, I was observing the landing on the PLAT system in ready room one. After observing the landing and reviewing the tapes I could find nothing that would indicate an unusually harder than normal landing. The aircraft appeared to be a little fast (3-5 kts) with a slight left wing down just prior to touchdown.

(b) (5) [REDACTED] (b) (5) [REDACTED]

As squadron LSO I have maintained a record of all of LT [REDACTED] (b) (6)  
carrier landings (66 day / 21 night) since the commencement of our deployment.  
A review of these landings show no dangerous tendencies or radical maneuvers.

I have been designated a Naval Aviator for 4 years and have 1182 hours  
(1000 jet) and 272 carrier arrested landings (272 jet). I am currently  
qualified to control all type airplanes, day and night, aboard FORRESTAL.

I have 320 hours and 110 arrested landings in the F-4B.

(b) (6) [REDACTED]

[REDACTED]

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (5)

STATEMENT OF LTJG [REDACTED] (b) (6) 1310, USN, Observing LSO,  
Concerning VF-74 AAR 1-63 occurring 21 JAN 1963, F-4B, BUNO 148426,  
Pilot [REDACTED] (b) (6)

During the 1630 recovery I was the observing LSO from VF-74. LT (b) (6) was flying BW103, BUNO 148426, at this time. On his first pass, he was waved off for a fouled deck, this approach being normal in all respects. On his second approach, his start was a little fast, and the LSO advised him of his speed. LT (b) (6) slowed down to normal approach speed well out in the groove. Close to the ramp, it was noted that he had gone slightly high, and that he made a slight power reduction correction. His attitude was steady, and he never dropped his nose. The pass was in all respects normal, and the landing not noted as being hard in any manner. The pilot has shown consistently fair passes during this deployment with no dangerous tendencies, nor specifically any tendencies toward hard landings. There was never any reason for initiating a wave-off on either the part of the pilot or LSO. The SPN-12 was at the time erratic and not reliable.

It was noted by all LSO's, that the sound of this arrestment was strange. Normal landings resound with a sharp thud as the aircraft strikes the deck. This is particularly true of the F-4B aircraft due to its speed and weight. On this particular landing there was no such defined noise on touchdown, but rather a dull, undefined mushing sound, as if the gear had never actually absorbed the shock of landing. The aircraft listed gradually to the starboard on runoff.

I was designated a Naval Aviator on 1 December 1961, have 380 hours of flight time, and 92 arrested landings in the F-4B. I have observed 1500 landings this deployment as LSO under training.

(b) (6)  


SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (6)

STATEMENT OF CDR (b) (6) /1310, USN, Air Officer,  
Concerning VF-74 AAR 1-63 occurring 21 JUN 1963, F-4B, BuNo 148426,  
Pilot (b) (6)

As Air Officer I was in Primary Fly for the 1630 recovery on 21 January 1963. The recovery proceeded normally with F-8's, F-4's, and A-4's landing, nine or ten of them prior to F-4B Backwash 103. BW103 made a normal pattern and approach except he was fast. The LSO made a transmission of "You're fast" and my SPN-12 indicated 150 knots. The relative wind was 35 knots down the angle deck and the time was about 1635A.

BW103 engaged arresting gear wire number 3 in a normal attitude. At the second of his engagement his main mounts hit in the vicinity of number four wire and there was a large puff of bluish smoke that came from the starboard wheel area.

BW103 remained engaged and continued up the deck coming to a stop on the left main mount, nose wheel and starboard wing pylon fuel tank. Crash and salvage was effected and a clear deck attained in 11 and  $\frac{1}{2}$  minutes.

I have been a Naval Aviator for 19 years, 9 months, and have 4600 hours and 275 carrier landings. I have been Air Officer aboard CORAL for 17 months.

(b) (6)

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (7)

STATEMENT OF LCDR [REDACTED] /1310, USN, VF-103 Pri-Fly Observer,  
Concerning VF-74 AAR 1-63 occurring 21 JAN 1963, F-4B, BUNO 148426,  
Pilot (b) (6)

I was the VF-103 Primary Fly observer for the 1630 recovery on 21 January 1963. During the recovery of the F-8C airplanes, I was standing directly behind the enlisted man charged with the responsibility of setting and/or directing the setting of the arresting gear and Fresnel Lens. I was in this position at the time of the accident.

As Backwash 103 entered the groove, my attention was momentarily diverted when the enlisted man mentioned in the preceding paragraph made a comment over his sound powered phones for the arresting gear personnel to check the gear settings. While looking at the gear settings, my attention was again brought rapidly back to Backwash 103 in the groove by one or more comments from personnel standing near me to the effect that 103 was "fast". As I looked up, I observed Backwash 103 a short distance out from the ramp in what I felt to be a considerably faster than normal approach. This was substantiated to some degree by a red approach light and a call by the LSO that he was fast. I expected to see the airplane waved off at this time. The approach continued, However and as the airplane came over the landing area, I noted the approach light go to amber. The airplane landed in the vicinity of the number four crossdeck pendant with the arresting hook engaging the number three crossdeck pendant. On touchdown, I noted a large puff of white smoke in the vicinity of the starboard wheel. The airplane almost immediately disappeared from my view as it continued its rollout. I proceeded to another vantage point to note that the rollout had been completed and that the starboard gear had failed.

I have been a designated Naval Aviator for eight years and have approximately 2350 flight hours and 340 carrier landings. I have been observing F-4B approaches from the vicinity of Primary Fly at frequent intervals during the past year of shipboard operations (b) (6)

[REDACTED]

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (3)

**STATEMENT OF LCDR [REDACTED] (b) (6)** /1310, USN, VA-81 Pri-Fly Observer,  
Concerning VF-74 AAR 1-63 occurring 21 JAN 1963, F-4B, BUNO 148426  
Pilot (b) (6)

I was Pri-fly Cbserver for Attack Squadron EIGHTY-ONE for the recovery on 21 January 1963. While waiting for the A-4B's, I watched the preceeding aircraft land. I saw Backwash's 103 approach and landing. I could not see the SPN-12 from where I was standing near the gear setting talkers position, but he appeared very slightly fast to me in the approach. Glide slope looked normal with several line-up corrections prior to crossing the ramp. The aircraft appeared to be in a slight left skid at touchdown with wings level. The right main mount emitted a puff of smoke on touchdown and I said "tire" to the enlisted man standing beside me. The aircraft disappeared from my view under the tower on what was apparently a normal runout. I was unaware that anything more serious than a blown tire was involved until I heard the Air Officer ask "Is there something wrong down under there?" or words to that effect. I went to the windows looking athwartships from Pri-fly and saw Backwash 103 with right main landing gear collapsed and the aircraft resting on the starboard drop tank.

I have had occasion to watch several hundred F-4B landings from Pri-fly (b) (5)

I have been a designated Naval Aviator for over 9 years and have 2025 flight hours and 319 carrier arrested landings.

(b) (6)

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (9)

STATEMENT OF LT [REDACTED] (b) (6) /1310, USN, VAW-12 Pri-Fly Observer,  
Concerning VF-74 AAR 1-53 occurring 21 JAN 1963, F-4B, BUNO 148426,  
Pilot [REDACTED] (b) (6)

I was in the after passageway leading to primary fly watching the 1630 recovery as VAW-12 DET-59 Pri-fly watch when F-4B side number 103 made its landing. After a steeper than normal turn onto final the aircraft made what looked to me like a normal approach though he seemed to go slightly high at the ramp. (b) (5) (b) (5) (b) (5) and on touchdown I saw a puff of white smoke and saw the starboard wing drop. As this happened the aircraft passed from my view. My immediate impression was that it had blown a tire.

I have been a designated a Naval Aviator for 9 years with 2500 flight hours and 120 prop carrier carrier landings.

(b) (6)



SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (10)

Damage To F-4B Bureau Number 148426

Parts Requiring Replacement

<u>NOMENCLATURE</u>	<u>PART NUMBER</u>
Center L/E Flap	32-19252-310
T/E Flap	32-18502-318
Door Assy., MLG	32-42101-2
Door Assy., MLG Outboard	32-42000-304
Lug	32-42057-3
Rod End Assy.	32-42005-3
Rod End Assy., MLG Outboard Door Link	32-42056-1
Hinge Half, MLG Outboard Door Support	32-11417-4
Link Assy., MLG Upper Shrink	32-41306-1
Rod End Assy., MLG Upper Shrink	32-41307-1
Drag Brace Actuator	32-41601-1
Fitting Assy., MLG Side Brace Lower	32-41613-1
Wheel Assy.	217A47
Drag Brace	32-41632-3
Strut Assy., MLG	32-41600-302
Pneumatic Brake Line	32-43204-8
Hydraulic Brake Line	32-43204-7
Clamp (2 ea)	AN735-25
Line Assy., Landing Gear up	32-69349-2106
Pin, MLG Outboard Door Hinge	32-42051-5
Link Assy.	32-42005-1

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAVINST 3750.6

Page 1 of ENCLOSURE (19)

PARTS REQUIRING REPAIR

Fwd Spar Assy.

32-11011-310

Aft trunnion bearing support fitting which is a part of 32-11012-306 spar assy.

T/E outer wing honey comb.

Repair of wire bundle on main gear.

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

Page 2 of ENCLOSURE (19)

Resume of LT

(b) (6)

## Flight Experience:

<u>PERIOD</u>	<u>AIRCRAFT FLOWN/HOURS</u>	<u>UNIT</u>
July '55 - May '56	T-6 (SNJ) / 175 T-28B / 32	Basic Training
July '56 - Oct '56	T-33B (TV-2) / 76 F-9F (F9F) / 30	NAVANTRACOM
Nov '56 - Mar '57	TC-45J (SNB/J) / 31 F-9F (F9F) / 1	FASROC 9 Cecil Field
Mar '57 - Mar '59	TC-45J (SNB) / 14 T-33B (TV-2) / 18 F-2D (F2H-4) / 21 F-6A (F4D-1) / 295 T-28B (T28) / 2	VF-102
Apr '59 - Dec '60	F-6A (F4D-1) / 437 T-33B (TV-2) / 8 C-47J (R4D) / 37	VF-101
Jan '61 - Jun '62	TC-45J (SNB) / 3 F-6A (F4D) / 4 TF-10B (F3D) / 60 F-4B (F4H) / 187 TF-9J (F9F-8T) / 36 F-8C (F8U-2) / 3	VF-101 DET A
Jul '62 - Present	F-4B (F4H) / 126	VF-74

Deployed (Last 6)

<u>MONTH</u>	<u>HOURS</u>	<u>CV LDGS</u> <u>DAY/NIGHT</u>
OCT.	25.7	12/3
NOV.	19.1	10/1
DEC.	16.2	6/3
JAN.(until 21st.)	18.5	9/2

It is noted that LT (b) (6) has had no periods of proficiency flying since commencing flight training. He has averaged over 200 hours per year primarily in jet type aircraft.

Authenticated:

(b) (6)

(b) (6)

LCDR, USN

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAV INST 3750.6

ENCLOSURE (20)

Statement of LCDR [REDACTED] (b) (6) 552160/1310, USN, VF-74 Maintenance Officer, concerning VF-74 AAR 1-63, F-4B BuNo 148426, occurring at 1637, 21 January 1963, on board USS FORRESTAL (CVA-59).

F-4B BuNo 148426 was given a daily and preflight inspection on the morning of the twenty-first of January in accordance with NAVWPS CL-245FIMA-6-1 inspection card set dated 15 September 1962, which are presently in effect, after which it flew a satisfactory flight. Upon termination of the first flight another preflight was held and no discrepancies noted. The aircraft was considered to be in excellent material condition. It had flown five flights since periodic inspection, including the test flight, which were gripe free except for one radar discrepancy.

The following is a list of Service Changes coded "F" which had not been incorporated in F-4B BuNo 148426 at the time of the accident.

ASC	NOMENCLATURE
R 94	AFCS Wiring
U 112	Addition of Doublers No. 2 Fuel Cell
R 116	APA 128 Transmitter Circuitry
R 120	Screened Fittings to Pneumatic Valves
U 127A	No. 2 Fuel Tank Transfer Line

Listed below are facts pertaining to F-4B 148426 as of the date of accident including resume of its last ten flights prior to the accident.

Months in service 13

Total aircraft hours 309

Total flights since check 5

Total hours since check 7.6

Total landings as follows:

Total carrier arrested 99

Bolters 7

Field carrier landings practice 114

Field Landings 129

Total 349

Enclosure (21)

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAVINST 3750.6

Last major inspection completed on 1-11-63

DATE	DURATION	DISCREPANCY	CORRECTIVE ACTION
12-14-62	1.9	1) Radar circuit breaker popped.	Repaired frayed wire in control handle
12-26-62	2.1	1) Nose wheel tires vibrated after take off while retracting gear. 2) Auto pilot pitches aircraft up and down when engaged	Changed both nose tires Changed stabilator actuator and auto pilot amplifier
12-27-62	1.7	None	None
12-27-62	1.7	None	None
12-27-62	1.9	1) Nose pitch when APCS engaged, Stab aug kicks out on touch down	Changed stabilator actuator and auto pilot amplifier
1-11-63	1.7	1) Test out of Major-No discrepancies	None
1-11-63	2.0	None	None
1-12-63	0.8	1) Radar discrepancy	Replaced fuse
1-21-63	1.7	None	None
1-21-63	1.6	1) Starboard gear collapsed after engagement of arresting gear	

#### LANDING HISTORY

26 April 1962 - Hard CV landing. All tires required replacement including R/H broke assembly. Minor skin damage was discovered behind and under R/H LE flaps. Bracket and access plate manufactured to replace damaged components around LE of the R/H wing missile pylon.

21 June 1962 - Hard CV landing. No discrepancies noted.

10 July 1962 - Hard CV landing. Both tires blown. L/H engine dropped 1/4 inch due failure of the half barrel nut on forward engine mount. Compression buckles on under side L/H wing near speed break well. Structural integrity affirmed following inspection by K and Z personnel from MCAS Cherry Point.

13 August 1962 - R/H main strut flat after landing. Strut re-packed.

18 August 1962 - CV landing with full external wing drop tanks aboard. No discrepancies noted.

4 September 1962 - R/H strut discovered flat during in port pre-flight. Strut re-packed.

11 December 1962 - Hard CV landing. No discrepancies noted.

Hard landings referenced above are landings in which the pilot or LSO feel it was harder than normal and sufficiently hard to warrant an inspection of the airplane.

LANDING HISTORY (CONTINUED)

Hard landing inspections are conducted consonant with requirements of NAVWEPS 01-245FDM-6-2 card number 88 ("WHENEVER AIRCRAFT IS SUBJECTED TO EXTREME HARD LANDING") and logged. In addition, inspection details of cards 90 through 94 ("OVERSTRESSED AIRCRAFT STRUCTURAL INSPECTION") are used on occasion with exception of removal of PC system reservoirs.

The following added features are inspected based on local experience with recorded hard landings.

- A. Visual inspection of landing gear trunnion fittings, wheel assemblies, actuator struts and all hydraulic and pneumatic lines attached to or in the vicinity of all three gear, for fractures, distortion, and any other abnormalities.
- B. Internal inspection of the intake ducts.
- C. Internal inspection of the engine mounting bolts. (Enclosure (2))
- D. A thorough inspection of the external surface of the airplane for popped rivets, wrinkled skin, and any abnormal distortions.

Engine mounting bolt failure due to hard CV landings has not occurred since replacement of the half barrel nut P/N 4663-080 with the newer full barrel nut P/N 6200-080.

The side brace actuators were checked by the contractor on 18 January 1962 in accordance with the requirements of BUWEPS TWX 000397Z dated 31 October 1962. The actuators were again inspected during periodic check in accordance with the requirements of BUWEPS message 302158Z October 1961 and 022201Z November 1961 as supplemented by COMNAVAIRLANT message 012157Z October 1961 and 062117Z November 1961, respectively.

Enclosure (21)

SPECIAL HANDLING REQUIRED IN ACCORDANCE WITH OPNAVINST 3750.6

AIRCRAFT CONDITION AND DISPOSITION REPORT  
(Rev. 6-59)

Aer-Rep MA-78

Submit original and one copy without letter of transmittal to the cognizant Bureau of Aeronautics Maintenance Representative and one copy to the following activities: (1) NAVAVNSAFEACTY NAS Norfolk, (2) Controlling Custodian, (3) O&R, (4) Reporting Custodian, (5) Log Book, (6) Controlling Activity (if ferry aircraft), (7) ComNAB, (if ferry or other transient aircraft and a ComNAB is concerned), and (8) Ferry Squadron, (if concerned).

FROM Commanding Officer, MCAS, Cherry Point, N. C.		SERIAL NUMBER <u>4-63</u>	DATE <u>5 March 1963</u>
TO <del>BUREAU OF AERONAUTICS MAINTENANCE REPRESENTATIVE</del>		Bureau of Naval Weapons Fleet Readiness Representative, Atlantic, NAS Norfolk 11, VA.	
REFERENCE (a) LATEST ISSUE OF BUAR INSTRUCTION <u>4710.1</u> (b) <u>BNPFLANT 271528Z Feb.</u>			
DATE OF ACCIDENT OR DAMAGE <u>21 January 63</u>		LOCATION OF AIRCRAFT <u>NAS Norfolk</u>	
AIRCRAFT MODEL <u>F-4B</u>		SERVICE TOUR <u>1</u>	REPORTING CUSTODIAN <u>VITRON 74</u>
BUREAU NUMBER <u>148426</u>		MONTHS THIS SERVICE TOUR <u>13</u>	ENGINE MODEL <u>J79GEN</u>
STATUS (Flyable, non-flyable) <u>Non-flyable</u>		FLIGHT HOURS THIS MONTH <u>None</u>	ENGINE DATA ENGINE BUREAU NUMBER <u>401215</u>
ACCEPTANCE DATE <u>1 Dec 1961</u>		FLIGHT HOURS THIS TOUR <u>305.9</u>	TIME ON ENGINE(S) SINCE NEW <u>248.5</u>
TOTAL OVERHAULS <u>None</u>		FLIGHT HOURS SINCE NEW <u>300.1</u>	TIME ON ENGINE(S) SINCE OVERHAUL <u>None Eng.</u>
STARBOARD			

## DETAILED DESCRIPTION OF DAMAGE AND REMARKS

See attached sheet.

OPNAVINST P3750.6D

Estimate - 700

$$\bullet 4,000 \times 9.732 = 38,928$$

\*\* See attached sheet, Note #1

ESTIMATED COSTS OF LABOR AND MATERIAL NECESSARY TO PLACE AIRCRAFT IN COMPLETE SERVICEABLE CONDITION

TOTAL MANHOURS	DIRECT <u>\$ 4,000</u> INDIRECT
TOTAL MANHOUR COST	<u>\$ 38,928.00</u>
NON-REPAIRABLE ASSEMBLIES COST	<u>\$ 17,150.00</u>
MATERIAL COST	<u>\$ 1,000.00</u>
SHIPPING OR TRANSPORTING TO O&R	<u>\$ EA</u>
TOTAL COST	<u>\$ 57,078.00</u>

## RECOMMENDED DISPOSITION

Aircraft be transferred to PR custody FPT to DOP MCAS Cherry Point for overhaul repair.

The following preparatory work shall be accomplished by the operating unit prior to acceptance by the Overhaul and Repair Department for repair:

- a. Remove ammunition, pyrotechnics and ejection seat charge.
- b. Remove spare and loose gear.
- c. Preserve engine(s).
- d. Drain and purge fuel cells and disconnect battery.
- e. Bring log books up-to-date and deliver with aircraft.
- f. Inventory aircraft and retain copy for reference.

ESTIMATED INDUCTION DATE FOR REPAIR (Contingent on availability of material)	ESTIMATED COMPLETION DATE
NAVAIRLANT VITRON-74 COMFLTAIRNORVA BNPFLANT NAS NORVA	SIGNATURE OF PLANNER AND ESTIMATOR  (b) (6)
COPY TO NAVAVNSAFEACTY NAS Norfolk Controlling Custodian O&R Department Reporting Custodian Log Book	SIGNATURE  (b) (6)

Damage incurred F-4B (F4H-1) BuNo 148426 due to hard landing  
aboard USS Forrestal

1. Starboard inner wing main spar P/N 32-11011-310 (Structural Fig. 2-7 IPB Vol. 1, Fig. 11, Index 19) at MLG trunnion point cracked.
2. Starboard wing outer aft spar P/N 32-11045 (Structural Fig. 2-7 IPB Vol. 1, Fig. 9, Index 29) at MLG trunnion point chipped.
3. Starboard MLG door, P/N 32-42101-2 damaged beyond repair.
4. Starboard MLG outboard door, P/N 32-42000-304 damaged beyond repair.
5. Starboard external fuel cell damaged beyond repair.
6. Starboard MLG strut damaged beyond repair.

**NOTE #1:**

Direct manhours indicated by this air damage report are the results of a preliminary investigation and should not be considered actual manhours required to restore the aircraft to a serviceable condition.

Mr. Jim Walker, ~~McDonnell~~ Field Service Representative, advised that factory engineers are currently working on a repair for the damaged spar area. Extent of repair at this time is unknown.

Supplemental information will be forwarded, if required, subsequent to the receipt of aircraft, repair data from the contractor, and performance of a structural alignment check.

13000/Rudm/060-0134  
13000/Rudm/061-0004  
13000/Rudm/062-0383  
13000/Rudm/063-0032  
WS-1/233  
3 May 1963

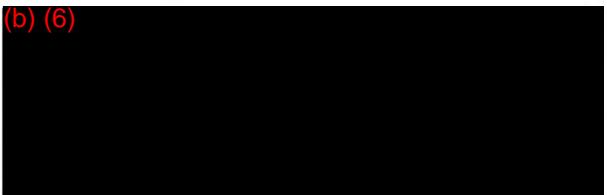
FIRST ENDORSEMENT on McDonnell Aircraft Corporation ltr 338-350-31761 of  
24 April 1963

From: Bureau of Naval Weapons Representative, St. Louis, Missouri  
To: Chief, Bureau of Naval Weapons (RA-262, RAAE-322)

Subj: Contracts NOa(s) 60-0134 and NOa 61-0004, 63-0383, 63-0032, Model  
F-4B Aircraft, Main Landing Gear Side Brace Actuator, End Fitting  
(P/N 32-41613-1); comments concerning

Encl: (1) of basic ltr

1. Forwarded, concurring with the comments and recommendations of the  
Contractor.

(b) (6)  


By direction

Copy to:  
McDonnell Aircraft Corporation  
NASC, NORVA (with encl (1))   
BUWEPS (RA-261), (FQGE)  
BUWEPSPLTREADREPLANT  
BUWEPSPLTREADREPPAC  
BUWEPSPLTREADREPCEN  
COMNAVAIRLANT  
COMNAVAIRPAC  
CGPMFLANT  
CGAIRFMFPAC  
CGFIRSTMARBRIG  
CGFIRSTMAW  
CGS2CONDMAW  
COAHIRDMAW  
NAS, NORIS  
NATSF, PHILA  
MCAS, CHERPT

MCDONNELL Aircraft Corporation  
Lambert-Saint Louis MUNICIPAL AIRPORT • BOX 516, ST LOUIS 66, MO

24 APR 1963

Ref: 338-350-31761

To: Chief, Bureau of Naval Weapons (RA-262, RAAE-322)  
Department of the Navy  
Washington 25, D.C.

Via: E.R., St. Louis

Subject: Contracts NOa(s) 60-0134 and NOw 61-0004, 62-0383 and  
63-0032; Model F-4B Aircraft; Main Landing Gear Side-  
Brace Actuator, End Fitting (P/N 32-41614-1); Comments  
Concerning

References: (a) USS Forrestal Message 222322Z of January 1963,  
VF-74 Flight Safety AMPUR 203  
(b) BNR Letter WS-1/50 of 31 January 1963 ✓  
(c) MAC Speedletter 701-350-31010 of 12 March 1963  
(d) MCAS Cherry Point Disassembly and Inspection  
Report No. 287 dated 14 December 1962

Enclosure: (1) McDonnell Laboratory Report 32A-139 of 1 March 1963,  
Metallurgical Examination of Failed MLG and MLG  
Side Brace ACTUATOR components (Two copies)

1. Reference (a) reported that the starboard main landing gear on F-4B airplane BuNo 148426(S/N 111) had collapsed during a normal carrier landing due to failure of the lower end fitting (P/N 32-41614-3 of assembly 32-41613-1) of the side-brace actuator. Investigation by the Contractor was requested by Reference (b). In Reference (c) the Contractor discussed probable causes of the failure and stated that additional comments would be presented upon completion of the investigation.
2. Enclosure (1) is the Contractor's laboratory report on two failed lower end fittings, P/N 32-41614-3, of the main landing gear side-brace actuators which had been removed from F-4B aircraft BuNos 148426(S/N 111) and 149471(S/N 188). Final results of the investigation of the fittings from BuNo 148426(S/N 111) confirm the Contractor's preliminary comments, presented in Reference (c), that failure occurred as a result of structural tension overload, with lack of bearing freedom a probable contributing factor. However, failure of the fittings from BuNo 149471(S/N 188) appears to be of a different nature. The Contractor concurs with the conclusion of O & R Cherry Point, presented in Reference (d) DIR, that failure of this lower end fitting was due to fatigue initiating in two material imperfections. However, the Contractor does

not agree that the subsequent failure of the associated MLG shock strut, P/N 32-41626 resulted from a fatigue defect in the aft trunnion. It is the Contractor's opinion that this trunnion had a normal structure and that failure occurred as a result of the heavy side load which occurred after loss of support from the side-brace actuator.

- (gross weights and  
not increasing and  
these factors will  
not increase weight.  
high gross weight  
high gross weight)*
- 3. In view of the circumstances involved in the failure of the side-brace actuator in BuNo. 148426(S/N 111), and since the Contractor is not aware of any other actuator failures due to material defects, as found in the fitting removed from BuNo. 149471(S/N 188), it is believed that the subject end fitting is satisfactory under normal landing conditions. However, in view of Increasing gross weights and other side-brace actuator problems, and in response to BuWeps request, the Contractor will submit an engineering change proposal (ECP No. MDA-F4B-505) for general re-design of the entire side-brace actuator which would include re-design of the subject end fitting to increase its strength. The presently planned production effectiveness for this change is Block 21(S/N 778) and subsequent, and retroactive incorporation in blocks 6 through 20 (S/N 48 through 777 will be proposed.
  - 4. Pending incorporation of the improved actuator, as noted above, the Contractor recommends that a dye-penetrant or magnaflux inspection of the subject end fitting of the present actuators be performed during PAR. The requirement for such inspection will be incorporated in the applicable F-4B manuals at the next authorized revision.

MCDONNELL AIRCRAFT CORPORATION

*L. A. Smith*  
L. A. Smith - Project Engineer F-4B

DBars

CC: DMR, St. Louis  
BuWeps (RA-261)  
BuWeps (FQ)  
BuWeps Flt Read Rep Pac  
BuWeps Flt Read Rep Lant  
BuWeps Flt Read Rec Cent  
COMNAVAIRLANT  
COMNAVAIRPAC  
CGFMFLANT  
CGAIRFMPPAC  
COFIRSTMARBRIG  
COFIRSTMAN  
COSECONDMAN  
COTHIRDMAN  
NASC, NORVA w/Encl.  
NAS NORIS  
MCAS, Cherry Point

## MCDONNELL

DATE 1 March 1963  
 REVISED \_\_\_\_\_  
 REVISED \_\_\_\_\_

ST. LOUIS, MISSOURI

## LABORATORY REPORT

PAGE 1 of 14  
 REPORT 32A-139  
 MODEL F-4B

## FINAL REPORT

CONTRACT NO.: Nov 62-0383-1LABORATORY : Structures

METALLURGICAL EXAMINATION OF FAILED MLG  
AND MLG SIDE BRACE ACTUATOR COMPONENTS

ABSTRACT

Fracture analysis, metallographic examination and hardness tests were conducted to determine the origin and type of failure of three failed parts from the MLG and NLG side brace actuator of the F-4B.

In November, 1962, a 32-41614 Lower End Fitting, of the side brace actuator on Ship Number 188 failed at N.A.S. El Toro, California. At the same time, a secondary failure occurred in the aft trunnion of the 32-41626 MLG Shock Strut Outer Cylinder. Failure of the lower end fitting was due to fatigue initiating at two large manufacturing defects. Failure of the aft trunnion was secondary in nature and due to excessive loads. No material deficiencies which contributed to failure of the MLG shock strut outer cylinder were found.

In January, 1963, a lower end fitting of the side brace actuator on Ship Number 111 failed aboard the U.S.S. Forrestal. Failure appears due to excessive loads, resulting from lack of rotation by the inner race. Hardness tests indicate that the tensile strength of the part was marginal.

This is Enclosure (1)  
 to McDonnell Aircraft  
 Corporation's letter  
 No. 334-350-21761.  
 Dated ... 4/24/63 ...

PREPARED BY R Newcomer  
 Test Engineer

APPROVED BY D. Deuellois  
 Senior Engineer, Materials and  
 Methods, Metallurgical Group

APPROVED BY

J.W. Hwang  
 Chief, Structures Laboratory

APPROVED BY

E.L. Parker  
 Laboratory Project Engineer

DATE 1 March 1963  
REVISED \_\_\_\_\_  
REVISED \_\_\_\_\_

# MCDONNELL

ST. LOUIS, MISSOURI

## LABORATORY REPORT

PAGE 2  
REPORT 32A-139  
MODEL F-4B

## FINAL REPORT

### 1. INTRODUCTION

Tests were conducted to determine the origin and type of failure on three failed parts from the MLG and the MLG side brace actuator of the F-4B.

A 32-41614 Lower End Fitting of the side brace actuator assembly on Ship Number 188 failed on November 1962 at N.A.S. El Toro, California. At the same time, a secondary failure occurred in the aft trunnion of the 32-41626 MLG Shock Strut Outer Cylinder. Both of these failures have previously been evaluated at MCAS, Cherry Point, North Carolina.

Another Lower End Fitting, P/N 32-41614, of the side brace actuator assembly failed on Ship Number 111. This failure occurred on 25 January, 1963 aboard the U.S.S. Forrestal.

Testing was conducted by the McDonnell Structures Laboratory during the period 8 through 25 February 1963.

### 2. DESCRIPTION OF TEST ARTICLES

The test articles consisted of two 32-41614 Lower End Fittings which screw into the 32-41611 Inner Cylinder of the 42-41601 Side Brace Actuator Assembly and the aft trunnion of the 32-41626 MLG Shock Strut Outer Cylinder.

### 3. TEST PROCEDURE

All three parts were examined visually and photographed to show the location of failures. Hardness measurements were taken to determine the conformance of the materials to heat treat requirements. Appropriate areas were then sectioned and examined metallographically to determine the type of failure.

### 4. TEST RESULTS

Figure 1 on page 5 shows the failed lower end fitting from Ship Number 188. Figure 2 on page 6 shows the dark area on the fracture surface where ultimate failure originated. Some evidence of symmetrical progression by the crack can be observed. Figure 3 on page 7 shows that a similar crack exists adjacent to the fillet radius on the opposite side. A section of the part was broken away, and this crack was found to be similar in size and identical in appearance to the one exposed by the failure. Heavy oxide scale formation present inside the crack was magnetic. Figure

DATE 1 March 1963  
REVISED \_\_\_\_\_  
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## LABORATORY REPORT

4-3 5  
REPORT 32A-139  
MOLLE F-4B

## FINAL REPORT

### 4. TEST RESULTS (CONTINUED)

4 on page 8 is a photomicrograph of the crack in the fillet radius showing the oxide scale and microhardness in this area.

Hardness of the failed end fitting was Rockwell C 47. This is equivalent to a tensile strength of 229 ksi per Federal Test Method Standard 151a and within the specified strength range of the part, which is 220-240 ksi. However, microhardness surveys indicated that some decarburization was present and that the surface was closer to Rockwell C43.

Figure 5 on page 9 shows the failed aft trunnion from Ship Number 188. Figure 6 on page 10 shows the fractured surfaces and the direction of crack propagation. A metallographic specimen was taken from the smooth fracture surface shown on Figure 6 which was termed an area of fatigue failure at MCAS, Cherry Point, North Carolina. Microstructure of the part in this area is shown in Figure 7 on page 11. The fracture appears unusually smooth, and on the basis of the inclusion running into the fracture, the fracture surface appears to be smeared, or damaged.

Hardness of the aft trunnion was Rockwell C48-49. This is equivalent to a tensile strength of 237-246, and at the upper limit of the specified strength range of 220-240 ksi. Microhardness surveys indicated that hardness in the area of grinding was Rockwell C44-45. This probably resulted from heat generated during grinding operations which were performed to provide clearance for hydraulic lines. No significant carburization or decarburization was observed.

Figure 8 on page 12 shows the failed end fitting from Ship Number 111 (note the apparent lack of rotation by the inner race). Figure 9 on page 13 shows the fracture surfaces and apparent origins of failure. Figure 10 on page 14 shows the microhardness variation from core to surface in the part. Hardness of the core was Rockwell C46. This is equivalent to a tensile strength of 222 ksi, or at the low side of the specified strength range of 220-240 ksi. However, carburization is present, and the surface hardness reached Rockwell C55. Evidence of this hardened case can be observed on the fracture surfaces shown in Figure 9 on page 13.

### 5. DISCUSSION OF RESULTS

Failure in the lower end fitting of the side brace actuator from Ship Number 188 was due to fatigue initiating in two large defects. Presence of magnetic scale and decarburization inside the part indicate that the defects were present during heat treating and probably formed during forging.

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ST. LOUIS, MISSOURI

DATE 1. March 1963

REVISED \_\_\_\_\_

REVISED \_\_\_\_\_

**LABORATORY REPORT**PAGE 4REPORT 32A-139MODEL F-4B**FINAL REPORT****5. DISCUSSION OF RESULTS (CONTINUED)**

Failure of the aft trunnion of the MLG appears to be secondary in nature and to be due to excessive loads. No material deficiencies were found which appear to have contributed to failure. Grinding operations had been performed on the part to provide clearance for hydraulic lines, and the hardness of the material was reduced approximately four Rockwell C points in the ground area. However, failure originated opposite the ground area, and fractures can be observed to propagate into it. While smooth fracture surfaces can be observed in the ground area, which could suggest that fatigue failure initiated in the area, metallographically this smooth fracture surface appears smeared. As a result, no contribution to failure initiation can be attributed to the ground area.

Failure of the lower end fitting of the side brace actuator from Ship Number 111 appears to be of an overload type, probably due to lack of rotation by the inner race. Hardness tests indicate that the part may have marginal mechanical properties and significant surface carburization.

**6. CONCLUSION**

Failure of the lower end fitting of the side brace actuator from Ship Number 188 was due to fatigue initiating in two large manufacturing defects. Failure of the aft trunnion of the MLG from Ship Number 188 was secondary in nature and due to excessive loads.

Failure of the lower end fitting of the side brace actuator from Ship Number 111 was due to excessive loads, probably caused by lack of rotation by the inner race.

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McDonnell Douglas

LABORATORY REPORT

D4E-671285

32A-

F-4E

FINAL REP

FIGURE 2 - FRACTURE SURFACES OF LOWER END FITTING



MAG. 2-1

M-13188



MAG. 24x

M-13187

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LABORATORY REPORT

52A-13

E-4B

D4E-27029

FINAL REPORT

FIGURE 1 - CRACK IN FILLET RADIUS OPPOSITE FRACTURE



H-151RA

MAG. X1

**MCDONNELL**

ST. LOUIS MISSOURI

D4E-270291

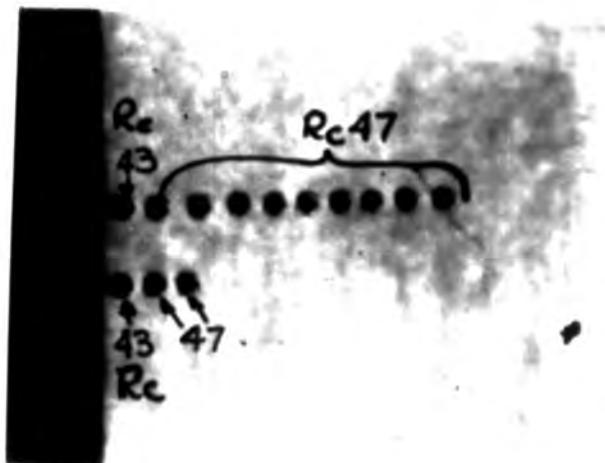
**LABORATORY REPORT**

32A-151

F-4B

FIGURE 4 - MICROHARDNESS OF FAILED END FITTING FROM SHIP NO. 188

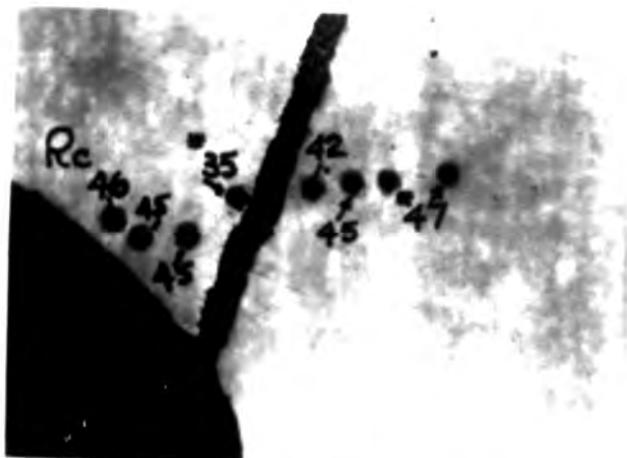
FINAL REPORT



OUTSIDE SURFACE, EYE DIA. 10MM

MAG. 75X

UNETCHED



ADJACENT TWO TRACKS  
IN FILLET RADIUS

MAG. 75X

UNETCHED

\* INDENTATION TOO CLOSE TO SURFACE

MCDONNELL

D4E-268035

FIGURE 5 - FAILED AFT TRUNNION FROM SHIP NO. 14

FINAL REPORT



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LABORATORY REPORT

D4 E-273289

52A-176

P-4B

FINAL REPORT

FIGURE A - FRACTURE SURFACES OF AFT TRUNNION



M-13185

MAG. 2X



M-13186

MAG. 2X

MCDONNELL

LABORATORY REPORT

SEA-124

F-4B

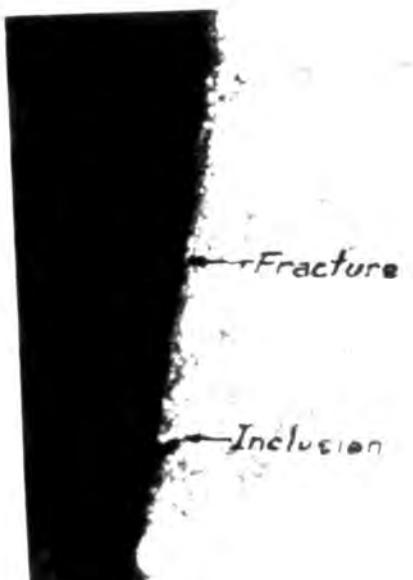
D4E-27 28

FINAL REPORT

FIGURE 7 - MICROSTRUCTURE NEAR SMOOTH FRACTURE IN AFT TRUNNION FROM SHIP NO. 186



MAG. 25 X  
ETCHANT: NITAL



MAG. 100 X  
ETCHANT: NITAL

MCDONNELL

32A-112  
F-4B

D4E-268636

FINAL REPORT

FIGURE 8 - FAILED LOWER END FITTING FROM SHIP NO. 111



MCDONNELL

32A-112  
F-4B

D4E-268636

FINAL REPORT

FIGURE 8 - FAILED LOWER END FITTING FROM SHIP NO. 111



MCDONNELL

D4E-268436

12  
32A-212  
F-4F

FINAL REPORT

FIGURE 8 - FAILED LOWER END FITTING FROM SHIP NO. 111



**MCDONNELL**

AIRCRAFT DIVISION

14

REF ID:

D4E-270287

**LABORATORY REPORT**

32A-151

REF ID:

F-4B

FINAL REPORT

FIGURE 10 - MICROHARDNESS SURVEY OF FAILED FITTING FROM SHIP 111



MAG. 75X

COPIES TO		
1 SENDER	3 J. J. PETERSEN	
2 MASTER FILE	H. I. PHILLIPS	
3 BUWEPSREP	2 J. E. RUTLEDGE	
4 H. D. BARKER	2 NAVY CONTR ADMIN	
A. J. BRICKLING	2 M. S. SMITH	
E. S. CHASE		
H. V. COLEMAN		
F. J. GHOSH		
2 G. A. KUNZICK		
H. E. MOORE		

TO	NOTE	ACTION
FOR:	COMMENT	RETURN
		FILE
OTHER COPIES SENT TO:		
NOTE	NOTE	
ACTION	ACTION	
COMMENT	COMMENT	
FILE	FILE	

## SPEEDLETTER

DLB:BW  
12 MARCH 1963  
701-350-31010

TO: CHIEF, BUWEPS (RA-262, RAAB-322)  
 VIA: BWR, ST. LOUIS  
 INFO: BWR, ST. LOUIS  
 BUWEPS (RA-261)  
 BUWEPS (PQ)  
 BUWEPSFLTREADREPLANT  
 BUWEPSFLTREADREPPAC  
 BUWEPSFLTREADREPCENT  
 COMMNAVAILRANT  
 COMMNAVAILRPAC  
 NATSP, PHILA

CCFMFLANT  
 CGAIRFMFPAC  
 CGFIRSTMARBRIG  
 CGFIRSTMAW  
 CGSECONDMAW  
 CGTHIRDMAW  
 NASC, NORVA ←  
 NAS NORIS  
 MCAS CHERRY POINT

## UNCLAS:

CONTRACT NOAS 60-0134, MODEL F-4B AIRPLANE; MAIN LANDING GEAR SIDE BRACE ACTUATOR.  
 END FITTING (P/N 32-41613-1); COMMENTS CONCERNING  
 A. USS FORRESTAL MESSAGE 222322Z OF JANUARY 1963, VF-74 FLIGHT SAFETY AMPTUR 203  
 B. BWR LETTER WS-1/50 OF 31 JANUARY 1963  
 C. BUWEPS SPEEDLETTER RAAB-322/1057:BLM OF 13 FEBRUARY 1963

- REFERENCE (A) REPORTED THAT THE STARBOARD MAIN LANDING GEAR ON F-4B AIRPLANE BUNO. 148426 (S/N 111) HAD COLLAPSED DURING A NORMAL CARRIER LANDING DUE TO FAILURE OF THE LOWER END FITTING (P/N 32-41614-3 OF ASSEMBLY 32-41613-1) OF THE SIDE BRACE ACTUATOR. INVESTIGATION BY THE CONTRACTOR WAS REQUESTED BY REFERENCE (B). REFERENCE (C) REQUESTED THE CONTRACTOR'S COMMENTS AS TO THE STATUS OF THIS INVESTIGATION.
- THE CONTRACTOR IS PRESENTLY PERFORMING A METALLURGICAL EXAMINATION OF THE FAILED END FITTING. PRELIMINARY FINDINGS INDICATE THAT FAILURE OCCURRED INSTANTANEOUSLY DUE TO TENSION AT OPPOSITE INSIDE CORNERS (ADJACENT TO BEARING) AT APPROXIMATELY THE CENTER OF THE ROD END. THE MODE OF FAILURE INDICATES THE EXISTENCE OF NON-UNIFORM LOADING WHICH COULD HAVE RESULTED FROM A LACK OF BEARING FREEDOM. THERE WAS NO EVIDENCE OF FATIGUE.

This was received 21 Mar 63  
 Noted in M&M coding. More  
 info to come

212304Z

713

R/S

701-350-31010

PAGE 3

3. CONDITIONS WHICH COULD HAVE CONTRIBUTED TO THE ABOVE FAILURE ARE AS FOLLOWS:

A. INTERNAL HARDNESS OF THE FAILED FITTING (P/N 32-41614-3) IS WITHIN THE SPECIFIED HEAT-TREAT RANGE OF 220,000-240,000 PSI (RC 46-48). MICROSCOPIC EXAMINATION REVEALS A STRUCTURE NORMAL FOR THIS HEAT TREATMENT. HOWEVER, THERE IS AN INDICATION, BUT NOT CLEARLY DEFINED, OF A CARBON ENRICHED SURFACE TO A DEPTH OF APPROXIMATELY .010 INCHES.

B. WEAR MARKS IN THE HOUSING INDICATED THAT SOME SEIZING OF THE BEARING HAD OCCURRED AND HAD INTERFERED WITH PROPER BEARING MOTION. PROBABLE CAUSES OF THIS CONDITION ARE IMPROPER LUBRICATION OR PREVIOUS STRUCTURAL OVERLOAD. INFORMATION AVAILABLE TO THE CONTRACTOR INDICATES THAT, SINCE 21 JUNE 1962, AT LEAST FOUR HARD LANDINGS HAD BEEN EXPERIENCED BY THE NOTED AIRPLANE WITH THE SUBJECT END FITTING INSTALLED. IN ADDITION, IT IS SIGNIFICANT TO NOTE THAT DISASSEMBLY INSPECTION OF THE PORT MAIN LANDING GEAR SIDE BRACE ACTUATOR ON F-4B AIRPLANE BUNO. 149424 (S/N 141), WHICH HAD EXPERIENCED COLLAPSE OF THE STARBOARD MAIN LANDING GEAR, REVEALED A RESTRICTION OF MOVEMENT OF THE END-FITTING MONOBALL BEARING. THIS WAS ATTRIBUTED TO A DEFORMATION OF THE RACE FROM AN EXCESSIVE TENSION LOAD, RESULTING FROM A HIGH SINK SPEED LANDING. AN INSPECTION OF THE PORT SIDE BRACE ACTUATOR ROD END ON BUNO. 149420 (S/N 137) SHOWED A SIMILAR CONDITION. THIS AIRPLANE HAD ALSO EXPERIENCED COLLAPSE OF THE STARBOARD SIDE BRACE ACTUATOR DURING A LANDING.

4. THE ABOVE FINDINGS AND COMMENTS ARE BASED ON PRELIMINARY EXAMINATION OF THE  
UPPER HALF OF THE SUBJECT FAILED END FITTING. ADDITIONAL COMMENTS AND RECOMMENDATIONS  
WILL BE SUBMITTED UPON COMPLETION OF THE CONTRACTOR'S INVESTIGATION.

MCDONNELL AIRCRAFT CORPORATION

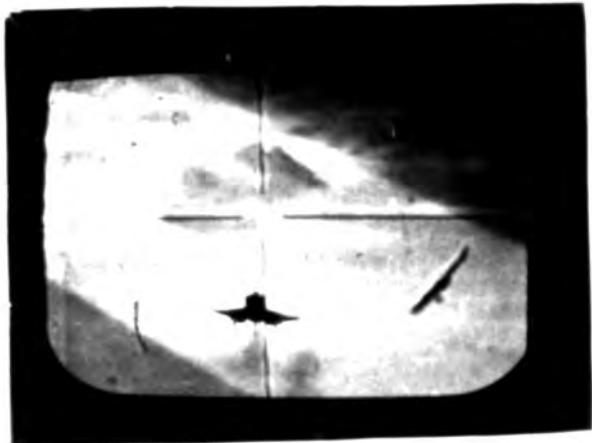
L. A. SMITH

**PROJECT ENGINEER - P-4B**

FIRST ENDORSEMENT  
SER. NO. WS/140 DATE 13 March 1963  
FROM: BUREAU OF NAVAL WEAPONS REPRESENTATIVE, ST. LOUIS, MO.  
TO: Chief, Bureau of Naval Weapons  
VIA: (RA-262, RAAE-322)  
REF:  
ENCL:  
  
1. FORWARDED for [redacted] (b) (6)  
SIGNED [redacted] (b) (6)

THE STATE PERSON AUTHORIZED TO SIGN

## OUTGOING MESSAGE





R/A WIRELESS - FMT 2.17.04.DAT.DAT

VF-A 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

BRONZE ~



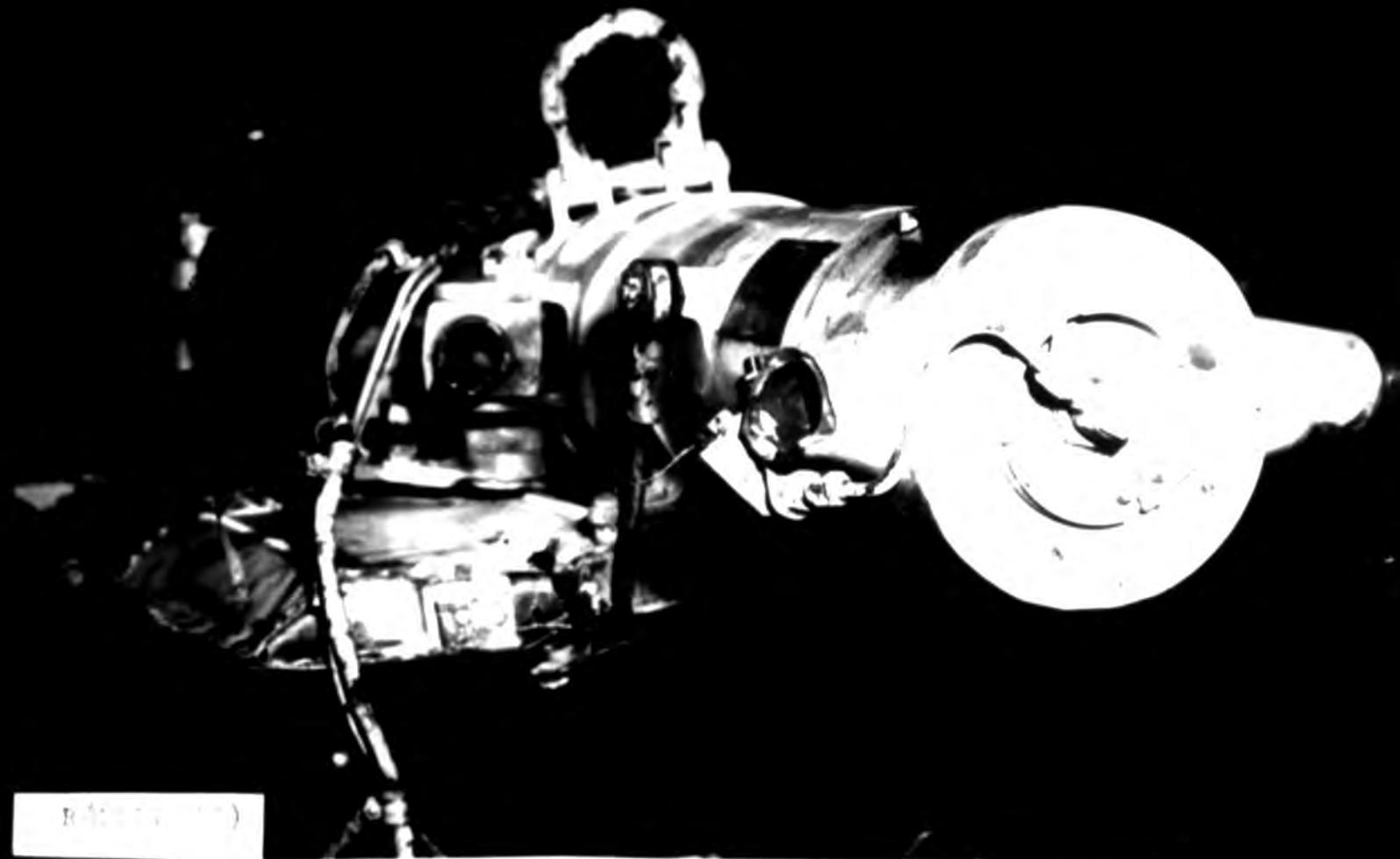
PHOTO BY ROBERT D. MAYER 1/20/61

VINTAGE 1961, 1 MINUTE, COLOR, 8MM



M

WEDNESDAY, JULY 1, 1964



Rover (1)

— 1970-07-07, 1970-07-07 — 1970-07-07 — 1970-07-07 —



R/11.10.1974 - 1000000000

WF-74 1000000000, 1000000000, 1000000000

H-1

16

SPECIMEN



## DEPARTMENT OF HOUSING

VF-74, 100% , 1.35% , 4.2%, 100% (K=0.1)

DRG'S UPGRADE  
ASSY.  
P/N 32-41652-7

UPPER PART OF MLG  
ASSY.  
P/N 32-41600-302

LINK ASSY  
MLG UPPER SHINK  
P/N 32-41307-1

Rod end ASSY.  
SHINK  
P/N 32-41307-1

R/H MLG ASSY. ON AND OFF POSITION

VF-74 100% 100% 100% 100% 100% 100% 100% 100% 100% 100%

## SECTION A - IDENTIFICATION

1. FROM (Name and mailing address of activity) <b>USS FORRESTAL (CVA-59) Care of Fleet Post Office, New York, New York</b>							2. NOR NUMBER <b>1-63</b>		
(b) (6)			DATE <b>2-6-63</b>		4. SIGNATURE (Name and rank of Medical Officer or Designating Authority) DATE <b>F. E. SPENCER CDR USN</b> <b>2-6-63</b>				
5. TYPE OF MISHAP <input checked="" type="checkbox"/> ACCIDENT <input type="checkbox"/> GROUND ACCIDENT <input type="checkbox"/> INCIDENT		6. TIME AND ZONE <b>1637A</b>		7. DATE <b>1-21-63</b>		8. GEOGRAPHICAL LOCATION <b>Mediterranean Sea</b>			
9. MODEL A/C <b>F4B</b>		10. BU NO <b>148426</b>		11. NO. OF OCCUPANTS <b>2</b>		12. TYPE ACCDT. <b>L1</b>		13. DAMAGE CODE <b>B</b>	
15. INDIVIDUALS INVOLVED - USE ADDITIONAL SHEETS IF REQUIRED. NAME (Last, first and middle initials) IN CONTROL OF A/C			16. UNIT TO WHICH ATTACHED <b>VF-74</b>			17. RANK, RATE <b>LT</b>	18. FILE/SERV. NO. DESIGNATOR <b>(b) (6)</b>	19. BILLET <b>Pilot</b>	20. BRANCH OF SERVICE <b>USN</b>
(b) (6)			VF-74			LT		RIO	USN
c.									
d.									
23. CLARIFICATION OF ITEMS 15-22 WHEN NECESSARY									
24. MODEL - OTHER A/C IF INVOLVED		25. BU NO		26. NO. OF OCCUPANTS		27. UNIT OPERATING A/C		28. DAMAGE CODE	
29. DETAILED NARRATIVE ACCOUNT OF ACCIDENT (Use additional # X 10S plain sheets if required)									

## SECTION B - MEDICAL OFFICER'S QUESTIONNAIRE

YES	NO	DID THE FLIGHT SURGEON:	(If "NO," state reason in space below.)		
X		1. VISIT THE SCENE OF THE MISHAP?			
X		2. PARTICIPATE FULLY IN THE FIELD INVESTIGATION?			
X		3. PARTICIPATE FULLY IN THE DELIBERATIONS OF THE A/C ACCIDENT BOARD?			
GIVE APPROXIMATE NUMBER OF HOURS SPENT BY THE FLIGHT SURGEON:		4. IN FIELD INVESTIGATION <b>1 Hour</b>	5. IN BOARD DELIBERATIONS <b>3</b>	6. IN PREPARATION OF THIS REPORT <b>7</b>	
7. REPORT PREPARATION CHECK LIST					
<input type="checkbox"/> ALL PARTS OF FORM COMPLETED		<input type="checkbox"/> SURVIVORS' NARRATIVES	<input type="checkbox"/> PHOTOS	<input type="checkbox"/> CONCLUSIONS AND RECOMMENDATIONS	<input type="checkbox"/> REQUIRED COPIES FURNISHED

## SECTION C - PHYSIOLOGICAL, HUMAN ENGINEERING, DESIGN, SOCIO-PSYCHOLOGICAL, AND TRAINING FACTORS WHICH CONTRIBUTED IN SOME DEGREE TO THIS A/C ACCIDENT, INCIDENT, OR GROUND ACCIDENT

E	S	P	✓ FACTORS	E	S	P	✓ FACTORS	
<b>PHYSIOLOGICAL:</b>								
			1. Physically incapacitated in flight				29. Expeditions/Delays	
			2. "G" forces				30. Weather	
			3. Environmental stress - External	X			31. Mechanical Problems	
			4. - Internal				32. Social and working relationships	
			5. Dysbarism/explosive decompression				33. Personal comfort	
			6. Diet				34. Regulations	
			7. Fatigue				35. Facilities	
			8. Hypoxia				36. Navigation	
			9. Related illness				37. Duty assignment	
			10. Vertigo/Disorientation/Illusions				38. Personality traits	
			11. Hyperventilation				<b>NON-STRESS FACTORS:</b>	
			12. Drugs				39. Faulty attention	
			13. Physical state				40. Poor judgement	
			14. OTHER:				41. Forgetfulness	
<b>HUMAN ENGINEERING AND DESIGN:</b>								
			15. Personal equipment				42. OTHER SOCIO-PSYCHOLOGICAL FACTORS	
			16. Displays and/or controls				<b>TRAINING FACTORS:</b>	
			17. Work arrangement				43. Physiological training	
			18. Working environment				44. Emergency Procedures training	
			19. Habit interference				45. Survival and rescue training	
			20. OTHER:				46. Refresher training	
<b>SOCIO-PSYCHOLOGICAL: (Emotional stress from non-duty sources)</b>								
			21. Pregnancy				47. Transition training	
			22. Illness or death				48. OTHER:	
			23. Arguments					
			24. Elated/Depressed state					
			25. Personal habits - Drinking					
			26. - Sex					
			27. - Gambling					
			28. - Debts					

## SECTION D - AIR CREW DATA (fill in where applicable)

1. Flight time past 30 days	18.5	7. Total time in model	327.6
2. Flight time last 24 hours	1.6	8. Number of days grounded last month, give reason	
3. Number of flights in last 24 hours	1		None
4. Time at controls this flight	1.6	9. Number of and dates of previous accidents	Three (3)
5. Number of hours duty last 24 hours	9.0	1.	7 Oct. 56
6. Total flight time	1624.6	2.	27 Oct. 62
			17 Nov. 58

## SECTION E - CONTRIBUTING FACTORS AND THEIR ANALYSES (As condensed from Part I, Sect. B and Part VIII of the AAR)

NOTE: Fill in this section only on that set of forms prepared for FIRST individual listed in Section A, i.e. 15(a). Attach additional sheets as necessary.

## CONTRIBUTING FACTORS AND THEIR ANALYSIS

### A. Contributing Factors.

1. Material failure or malfunction
2. Undetermined.

### B. The Analysis.

**Personnel Factors.** Both pilot and RIO were physically fit and AA for flying. They were experienced in the F-4B and had proper amount of nourishment and rest prior to the flight.

**Material Failure.** The committee feels that failure of the side brace actuator end eye fitting occurred first as manifested by the R/H tire marks describing an erratic for a distance of 174 feet from the point of touch-down. During five previous known hard landings of this aircraft this part had never been changed because no damage to it was evident. It is felt that this accident resulted from progressive metal fatigue of the part in question.

Presently there is no immediate method for quantitative, rapid assessment of landing loads. The Giannini statistical accelerometer is inoperative when the landing gear is lowered and use of the cockpit accelerometer is also considered inadequate. Instrumentation for measuring touch down rate of descent is needed aboard ship. Inspection requirements for hard landings are also in need of revision.

## RECOMMENDATIONS.

F-4B operating activities ZYGL0 inspect side brace actuator end eye fittings following known hard landings to assist in determining the integrity of that part.

The contractor investigate the main landing gear load distribution with emphasis on the designed capability of the side brace actuators and the overall view of hard landing requirements.

A system be developed to give fleet capability for instantaneous assessment of carrier landing sink speeds.

## SECTION F - SAFETY, PERSONAL, AND SURVIVAL EQUIPMENT

Prepare a narrative account of damaged or failed items. Identify each item discussed (e.g., F1, F2, etc.)

NAME OF INDIVIDUAL (Last, first, middle)	(b) (6)	GENERAL DESCRIPTION OF EQUIPMENT	AVAILABILITY YES NO	SPECIFIC MODEL OR TYPE	UTILIZED		FAILED		DESCRIPTION OF DAMAGE TO EQUIPMENT	MODEL A/C F-4B
					YES	NO	YES	NO		
1. Shoulder harness		MK5-H seat	X				X			
2. Lap belt		Survival Kit Type	X				X			
3. Inertia reel	X	MK-H seat	X				X			
4. G-Suit										
5. Pressure suit-full or partial	(2)									
6. Exposure suit	X	Mark - 5			X			X		
7. Flight suit (Other than above)		APH-5								
8. Helmet	X	Tinted Visor			X			X		
9. Goggles/Eyeshield	X	Iron Age			X			X		
10. Shoes	X	Summer			X			X		
11. Gloves	X	MK-3C			X			X		
12. Life vest	X	PK-2					X			
13. Life raft	X						X			
14. OTHER:										
15. SIGNAL DEVICE - Flare (Night)	X	MK-13 MOD-0					X			
16. - Flare (Day)	X	MK-13 MOD-0					X			
17. - Dye marker	X	Sea Dye Marker					X			
18. - Radio	X	PRC-49					X			
19. - Flashlight	X	Mercury 761					X			
20. - Mirror	X	Signalling					X			
21. OTHER:	(1)	Pistol .38 cal.					(2)			
22. SURVIVAL GEAR - Knife	X	Survival					X			
23. - First aid kit	X	PSK-2					X			
24. - Shelter	X	Poncho PK-2					X			
25. - Food	X	LA Food Packet					X			
26. OTHER:										
27. RESCUE - Vehicle	X	Destroyer & Helo			-X-	(1)				
28. - Sling, Net, Stretcher	X	Net			-X-	(1)				
29. OTHER:	X	Pistol .38 Cal.			-X-					

## SECTION G - DETAILED EQUIPMENT QUESTIONNAIRE

1. MASK - MODEL OR TYPE <b>A13-A</b>	2. MODIFICATIONS, IF ANY <b>Sierra Fittings (1)</b>	
3. REGULATOR - MODEL OR TYPE <b>Bendix C-1 (6)</b>	4. MODIFICATIONS, IF ANY	
5. PREFLIGHTED BY USER? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	6. IF NO, WHY NOT	7. LIST DISCREPANCIES NOTED BY PREFLIGHT CHECK
8. OXYGEN SUPPLY: <input checked="" type="checkbox"/> PRIOR TO FLIGHT <b>9 LITERS (Liquid)</b> P.S.I. (Gas)	TIME OF ACCIDENT <b>9 LITERS (Liquid)</b> P.S.I. (Gas)	9. WAS OXYGEN IN USE AT TIME OF ACCDT. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
10. IF YES, WAS SELECTOR SETTING <input checked="" type="checkbox"/> 100% <input type="checkbox"/> NORMAL	11. WAS ALL OXYGEN EQUIPMENT NECESSARY FOR THIS FLIGHT AVAILABLE? IF NO, LIST ITEMS AND REASON WHY. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
12. WAS OXYGEN MADE REMOVED AT ANY TIME IN FLIGHT? IF YES, GIVE DURATION AND REASON. <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		
13. TYPE CHUTE RELEASE DEVICE <b>Rocket Jet (1)</b>	14. TYPE HARNESS RELEASE DEVICE <b>Quick Disconnect (1)</b>	15. WHEN WERE RELEASE DEVICES ACTIVATED? <b>N.A. (4)</b>
16. WERE DIFFICULTIES ENCOUNTERED WITH RELEASE DEVICES? IF YES, STATE DIFFICULTIES, WHEN ENCOUNTERED AND CAUSE. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
17. WERE DIFFICULTIES ENCOUNTERED AFTER ACTIVATING RELEASE DEVICES? IF YES, STATE DIFFICULTIES, WHEN ENCOUNTERED AND CAUSE. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
18. WAS LIFE VEST INFLATED PRIOR TO ACTIVATING RELEASE DEVICES? IF YES, WHAT DIFFICULTIES DID THIS PRODUCE? <input type="checkbox"/> YES <input type="checkbox"/> NO	<b>N. A.</b>	

(CONTINUED ON SEPARATE FORM 3750-8C)

## SECTION 6 - DETAILED EQUIPMENT QUESTIONNAIRE (Continued)

NAME OF INDIVIDUAL (Last, First, Middle): (b) (6)

MODEL A/C

F-4B

RESTRAINT HARNESS	58. INTEGRATED HARNESS SYSTEM, MODEL/TYPE <b>ML-2</b>	59. INTEGRATED <input checked="" type="checkbox"/> FULL <input type="checkbox"/> PARTIAL	60. MODIFICATIONS, IF ANY STATE REASON <b>BUNEPS Aviation Clothing &amp; Survival Equip. Bulletin #12-62</b>
	61. DID INTEGRATED HARNESS FIT PROPERLY? IF NO, LIST DISCREPANCIES IN FIT AND GIVE REASONS THEREFOR <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES		
HELMET	62. INTEGRATED HARNESS FITTING WAS CONDUCTED BY: <input type="checkbox"/> WEARER <input type="checkbox"/> FLIGHT SURGEON <input checked="" type="checkbox"/> PARACHUTE RIDER <input type="checkbox"/> AVIATION EQUIPMENT OFFICER <input type="checkbox"/> OTHER		
	63. IF SHOULDER HARNESS WAS USED, WAS IT: <input checked="" type="checkbox"/> LOCKED <input type="checkbox"/> UNLOCKED <input type="checkbox"/> TIGHT <input type="checkbox"/> BLACK <input type="checkbox"/> OTHER CONDITION		
PARACHUTE	64. TYPE HELMET <b>APH-5</b>	65. LIST PRESCRIBED MODIFICATIONS <b>Sierra Fittings</b>	66. DID HELMET FIT PROPERLY? IF NO, GIVE REASON <b>See attached sheet (5)</b>
	67. OTHER MODIFICATIONS AND REASON FOR THEM <input type="checkbox"/> WEARER <input type="checkbox"/> FLIGHT SURGEON <input checked="" type="checkbox"/> PARACHUTE RIDER <input type="checkbox"/> AVIATION EQUIPMENT OFFICER <input type="checkbox"/> OTHER		
OTHER	68. TYPE CHUTE <b>NB 4004 PA (8)</b>	69. LAST PACKING DATE <b>1-5-63</b>	70. MODEL/TYPE BAILOUT OXYGEN <b>Scott Seat Kit (3)</b>
	71. AUTOMATIC RIPCORD, IF INSTALLED (Model and type) <input checked="" type="checkbox"/> NONE <b>(3)</b>		
72. DID AUTOMATIC RIPCORD FAIL? IF YES, WHY? <input type="checkbox"/> NO <b>N. A.</b>			73. WAS RIPCORD ACTIVATED <input type="checkbox"/> MANUAL <input type="checkbox"/> AUTOMATIC
74. IF MANUALLY ACTIVATED STATE REASON AND ANY DIFFICULTIES ENCOUNTERED			
75. DID CHUTE OPEN IMMEDIATELY? IF NO, GIVE REASON <input type="checkbox"/> YES <input type="checkbox"/> NO			76. ALTITUDE THAT CHUTE OPENED FEET
77. OPENING SHOCK RASH: <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> SEVERE			78. BODY ATTITUDE AT OPENING
79. CHUTE OSCILLATION PRESENT: <input type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> SEVERE			80. IF OSCILLATION WAS PRESENT, HOW WAS IT STOPPED?
81. WEATHER CONDITIONS DURING DESCENT (List in sequence)			82. TOPOGRAPHY OF LANDING SITE
83. WAS BAILOUT OXYGEN CONNECTED? <input type="checkbox"/> BEFORE EXIT <input type="checkbox"/> AFTER EXIT <input type="checkbox"/> NO <input type="checkbox"/> N.A.			84. WAS BAILOUT OXYGEN USED? IF NOT, WHY? <input type="checkbox"/> YES <input type="checkbox"/> NO
85. WHEN WAS IT ACTIVATED? <input type="checkbox"/> BEFORE EXIT <input type="checkbox"/> AFTER EXIT			86. GIVE DIFFICULTIES ENCOUNTERED WITH BAILOUT OXYGEN AND THEIR CAUSE, IF ANY
87. WAS CHUTE HARNESS: <input type="checkbox"/> TIGHT <input type="checkbox"/> SLUG <input type="checkbox"/> LOOSE			88. WAS A SITTING POSITION IN SLING OBTAINED DURING DESCENT? IF NOT, WHY? <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NOT ATTEMPTED
89. SEAT CUSHION IF PROVIDED (Model/Type) <b>(6)</b>			90. WAS PARACHUTIST LANYARD CONNECTED TO LIFE VEST OR KINSTIF? IF NOT, WHY? <input type="checkbox"/> NO <input type="checkbox"/> YES
91. LIST TYPE OF PARACHUTE TRAINING COMPLETED BY THIS INDIVIDUAL. <input type="checkbox"/> NONE			
92. IF ATTEMPT WAS MADE TO RELEASE PARACHUTIST DURING DESCENT, WAS RELEASE ACTIVATED SUCCESSFULLY? <input type="checkbox"/> YES <input type="checkbox"/> NO			93. IF NO, GIVE REASON
94. IF G-SUIT, EXPOSURE SUIT, FULL OR PARTIAL PRESSURE SUIT WAS WORN, DID IT FIT PROPERLY? IF NOT, LIST DISCREPANCIES IN FIT AND GIVE REASONS THEREFOR. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
95. WAS G-SUIT EQUIPPED WITH A SPRING-LOADED DISCONNECT ADAPTER? IF NO, GIVE REASON <input type="checkbox"/> YES <input type="checkbox"/> NO			
96. LIST ALL ITEMS OF NON-STANDARD CLOTHING OR SURVIVAL EQUIPMENT UTILIZED			
97. WAS ANY ITEM OF EQUIPMENT LOST? IF YES STATE ITEM, WHEN LOST, AND REASON FOR LOSS. <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES			98. WAS ANY ITEM OF EQUIPMENT DISCARDED? IF YES, STATE ITEM, WHEN DISCARDED, AND REASON FOR DISCARD. <input type="checkbox"/> NO <input type="checkbox"/> YES

#27. MODIFICATIONS ON APH-5 HELMET

- (a) BUAIR Aviation Clothing And Survival Equipment Bulletin #19-58.
- (b) BUAIR Aviation Clothing and Survival Equipment Bulletin #35-60.
- (c) BUAIR Aviation Clothing and Survival Equipment Bulletin #1-60.

## SECTION H - EMERGENCY EXIT FROM A/C AND SURVIVAL FACTORS

NAME OF INDIVIDUAL (Last, first, middle) [REDACTED]

MODEL A/C

F-4B

(b) (6) [REDACTED]

S	E	S-SUSPECTED, E-ESTABLISHED				REMARKS	
		1. EJECTION - Attempted					
		2. - Accomplished					
		3. - Through canopy					
YES	NO	EJECTION DIFFICULTIES ENCOUNTERED		IF YES, EXPLAIN DIFFICULTIES			
		4. - Prior to					
		5. - During					
		6. - Subsequent to					
		7. Give type and model of seat used					
		8. BAILOUT - Attempted					
		- Accomplished					
9. ALTITUDE AT TIME OF EXIT (feet)				10. ATTITUDE OR MANEUVER OF A/C AT EXIT OR IMPACT		11. AIRSPEED	
ABOVE SEA LEVEL _____ ABOVE TOPOGRAPHY _____							
(1) <input checked="" type="checkbox"/> GROUND <input type="checkbox"/> WATER		13. CONTROLLED? <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> UNKNOWN		14. POWER <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	15. WHEELS <input type="checkbox"/> UP <input checked="" type="checkbox"/> DOWN (2)	16. FLAPS <input type="checkbox"/> FULL <input type="checkbox"/> UP <input type="checkbox"/> PARTIAL	
17. CANOPY POSITION AT EXIT OR IMPACT <input type="checkbox"/> OPEN (2) <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/> JETTISONED		18. SEA STATE (2)		19. AIR TEMP. 50°	20. WATER TEMP. 8°F	21. A/C FLOATED SEC.	22. TIME IN WATER SEC. 23. TIME IN RAFT SEC.
24. BAIL OUT OR COLLISION WITH WATER OR GROUND		25. IS THIS THE RECOMMENDED EXIT? IF NO STATE REASON FOR CHOICE. <input type="checkbox"/> YES <input type="checkbox"/> NO					
26. DIFFICULTIES WITH THIS EXIT HERE <input type="checkbox"/> IN REACHING <input type="checkbox"/> IN OPENING <input type="checkbox"/> IN EXITING				27. STATE NATURE OF DIFFICULTY			
28. BODY POSITION DURING EXIT							
29. LIST OTHER FACTORS NOT INDICATED ABOVE WHICH Affected EXIT FROM A/C							

**SURVIVAL FACTORS:** Check factors below which are appropriate for this accident. Prepare a detailed narrative account of the factors checked below and attach to this form. Identify each item discussed by item number (e.g., H30, H31, etc.)

**COMMUNICATIONS:**

- (1)  30. Communicated position prior to mishap  
 31. Witnesses at scene  
 32. Electronic signal devices  
 33. Visual signal devices  
 34. Auditory signal devices  
 35. OTHER:

**TRAVEL:**

36. LAND  
 37. WATER

**SHELTER:**

38. Life raft  
 39. Parachute  
 40. A/C structure  
 41. Natural shelter  
 42. Man-made shelter  
 43. OTHER:

**WATER SOURCE:**

44. Desalter kit, seawater or solar still  
 45. Rain, dew, snow, ice, etc.  
 46. Processed beverages  
 47. Canteen, thermos, water breaker, etc.  
 48. Streams, ponds, wells, etc.  
 49. OTHER:

**MAINTAINING BODY TEMPERATURE:**

50. Items used as shelter  
 51. Items used as clothing  
 52. Fire  
 53. OTHER:

**ENVIRONMENTAL HAZARDS:**

54. Exposure to natural forces  
 55. Exposure to dangerous animals and plants  
 56. Unfriendly native population  
 57. OTHER:

**MORALE:**

58. Isolation  
 59. Psychological shock  
 60. Lack of motivation to survive  
 61. Boredom  
 62. Rationing, activities, and group coordination  
 63. OTHER:

**FOOD SOURCE:**

64. Prepared survival rations  
 65. Animals/plants  
 66. OTHER:

**SURVIVAL TRAINING RECEIVED PRIOR TO MISHAP**

- (1)  67. See attached sheet

#67. May 58, Exercise "Tenderfoot",  $2\frac{1}{2}$  week land survival course at Fort Bragg.

Jan 1960 - Dilbert Dunker and helo hoist.

Jan 1961 - Mobile Survival Training Unit, Oceana

Jan 1962 - (a) F4B ejection seat training.

(b) Paraharness hoist in hangar.

(c) Paraharness release, with full pressure suit in water;  
oxygen breathing under water with full pressure suit.

(d) Survival Swim.

## SECTION I - PATHOLOGICAL FACTORS (Use A to denote ANTE-MORTEM; P for POST MORTEM, when known and applicable.)

(b) (6)												MODEL A/C <b>F-4B</b>			
8. AGE	9. HEIGHT	10. WEIGHT	11. LOCATION AND DIRECTION FACING AT TIME OF ACCIDENT	12. INJURY CODE											
(b) (6)	(b) (6) INCHES	(b) (6)	<b>Pilot cockpit, Martin Baker Seat</b>	<b>E</b>											
13. UNCONSCIOUSNESS				14. INTERNAL INJURIES (Non-fatal cases)											
<input type="checkbox"/> SHORT DURATION <input type="checkbox"/> LITTLE SIGNIFICANCE				<input type="checkbox"/> OTHER (give size)											
HEAD INJURIES	15. CEREBRAL CONCUSSION				16. FACIAL INJURIES (a. e. o.)				17. INTRA-ORAL INJURIES						
	<input type="checkbox"/> MINOR <input type="checkbox"/> SERIOUS		<input type="checkbox"/> CRITICAL <input type="checkbox"/> FATAL						<input type="checkbox"/> RIGHT <input type="checkbox"/> LEFT		<input type="checkbox"/> LEFT				
18. TYPE OF FRACTURE	SKULL		VERTEBRAE (Specify Rx.)				SHOULDER GIRDLE	RIBS	PELVIS	UPPER ARM	LOWER ARM	HAND	UPPER LEG	LOWER LEG	FOOT
	CNS.	FACIAL	CERV.	MID.	LUMBAR	SACRAL				OCOCYX	R	L	R	L	R
SIMPLE															
COMPOUND															
COMMUNICATED															
BHS-LOCATION	JAW						SHOULDER	ELBOW	WRIST	HIP		KNEE		ANKLE	
19. AMPUTATIONS/AVULSIONS (State Parts)				20. LIST PRE-EXISTING PHYSICAL DEFECTS PRESENT AT TIME OF POST CRASH EXAMINATION											
None															
21. SOFT TISSUE INJURIES		LACERATIONS			CONTUSION/SPRAIN/STRAIN			ABRASIONS			22. DROWNED				
		WILD	MODERATE	SEVERE	WILD	MODERATE	SEVERE	WILD	MODERATE	SEVERE					
HEAD (a. e. o.)	VENTRAL										23. ASPHYXIA				
	DORSAL														
24. SHOCK															
NECK										25. EXPOSURE					
THORAX	VENTRAL										26. MILD				
	DORSAL														
ABDOMEN	VENTRAL										27. MODERATE				
	DORSAL														
EXTREMITIES	UPPER										28. SEVERE				
	LOWER														
25. BURNS	DEGREE	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	29. EXTENT OF CARBONIZATION:				
26. FROST BITE	AREA	HEAD/central	Dorsal		TRUNK/central	Dorsal		ARMS	LEGS		NOSE	COMPLETE	30. ARE TISSUE SPECIMENS OBTAINABLE?	31. YES	32. NO
NOTE: Attach a detailed narrative account of injuries, cause, structures causing injury, magnitudes of force, and include whether ANTE- OR POST-MORTEM if determined. It is necessary to give as clear a picture of injury cause and sequence as possible.															
27. ADMITTED TO SICK LIST? IF YES, GIVE DIAGNOSIS								28. DIAGNOSIS NO. (RAKED P-1294)				29. ESTIMATED STAY ON SICK LIST			
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO												DAYS			
30. GROUNDED? IF YES GIVE REASON												31. ESTIMATED DURATION			
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO												DAYS			
32. PRIMARY CAUSE OF DEATH (Use Basic Diagnostic Nomenclature, RAKED P-1294) 33. SECONDARY CAUSE OF DEATH															
No. _____								No. _____							
34. AUTOPSY PERFORMED?		35. PROTOCOL		36. AUTOPSY CONDUCTED BY		37. IF FLIGHT SURGEON DOES AUTOPSY USE "AUTOPSY GUIDE FOR A/C ACCIDENT FATALITIES", AFIP-1957.									
<input type="checkbox"/> YES <input type="checkbox"/> NO		<input type="checkbox"/> ATTACHED <input type="checkbox"/> WILL BE FORWARDED		<input type="checkbox"/> PATHOLOGIST <input type="checkbox"/> FLIGHT SURGEON											
38. SPECIMEN		TEST PERFORMED		RESULTS		SPECIMEN		TEST PERFORMED		RESULTS					
BLOOD:		1				TISSUE: (CNS) _____									
		2				+ MUSCLE									
		3				+ VISCERA									
UREA						OTHER									
S-I CONTENTS															
38. IF ULTRAVIOLET LIGHT OR OTHER SPECIALIZED INVESTIGATIVE PROCEDURES WERE USED AT THE MISMAP SITE OR AUTOPSY, LIST THEM IN THIS SPACE. FOR EACH ENTER IN THIS SPACE A NARRATIVE ACCOUNT OF THEIR RESULTS AND INTERPRETATION WILL BE ATTACHED.															

## SECTION C - PHYSIOLOGICAL, HUMAN ENGINEERING, DESIGN, SOCIO-PSYCHOLOGICAL, AND TRAINING FACTORS WHICH CONTRIBUTED IN SOME DEGREE TO THIS A/C ACCIDENT, INCIDENT, OR GROUND ACCIDENT

NAME OF INDIVIDUAL (Last, first, middle)

MODEL A/C

F-4B

(b) (6)

Check E-Established, S-Suspected, or P-Present for each factor selected. Additional 8X10" plain sheets will be used for the supporting account of items checked below. Identify each statement with the factor and section identification (e.g., C1, C2, etc.). Attach all sheets pertaining to these factors to this form upon completion.

E	S	P	✓ FACTORS	E	S	P	✓ FACTORS	
<b>PHYSIOLOGICAL:</b>								
			1. Physically incapacitated in flight				29. Expeditions/Delays	
			2. "G" forces				30. Weather	
			3. Environmental stress - External				31. Mechanical Problems	
			4. - Internal				32. Social and working relationships	
			5. Dyssarnergy/explosive decompression				33. Personal comfort	
			6. Diet				34. Regulations	
			7. Fatigue				35. Facilities	
			8. Hypoxia				36. Navigation	
			9. Related illness				37. Duty assignment	
			10. Vertigo/Disorientation/Illusions				38. Personality traits	
			11. Hyperventilation				<b>NON-STRESS FACTORS:</b>	
			12. Drugs				39. Faulty attention	
			13. Physical state				40. Poor judgement	
			14. OTHER:				41. Forgetfulness	
<b>HUMAN ENGINEERING AND DESIGN:</b>								
			15. Personal equipment				42. OTHER SOCIO-PSYCHOLOGICAL FACTORS	
			16. Displays and/or controls				<b>TRAINING FACTORS:</b>	
			17. Work arrangement				43. Physiological training	
			18. Working environment				44. Emergency Procedures training	
			19. Habit interference				45. Survival and rescue training	
			20. OTHER:				46. Refresher training	
<b>SOCIO-PSYCHOLOGICAL: (Emotional stress from non-duty sources)</b>								
			21. Pregnancy				47. Transition training	
			22. Illness or death				48. OTHER:	
			23. Arguments					
			24. Elated/Depressed state					
			25. Personal habits - Drinking					
			26. - Sex					
			27. - Gambling					
			28. - Debts					

## SECTION D - AIR CREW DATA (fill in where applicable)

1. Flight time past 30 days	20.3	7. Total time in model	408.1
2. Flight time last 24 hours	1.6	8. Number of days grounded last month, give reason	None
3. Number of flights in last 24 hours	1	9. Number of and dates of previous accidents	None
4. Time at controls this flight	0.0		
5. Number of hours duty last 24 hours	-8		
6. Total flight time	1169.1		

## SECTION E - CONTRIBUTING FACTORS AND THEIR ANALYSES (As condensed from Part I, Sect. B and Part VIII of the AAR)

NOTE: Fill in this section only on that set of forms prepared for FIRST individual listed in Section A, i.e. 15(1). Attach additional sheets as necessary.

See attached sheets.

## SECTION F - SAFETY, PERSONAL, AND SURVIVAL EQUIPMENT

Prepare a narrative account of damaged or failed items. Identify each item discussed (e.g., Fl, F2, etc.)

GENERAL DESCRIPTION OF EQUIPMENT	AVAILABILITY		SPECIFIC MODEL OR TYPE	UTILIZED	FAILED	DESCRIPTION OF DAMAGE TO EQUIPMENT	MODEL A/C
	YES	NO					
1. Shoulder harness	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MKS-H /Seat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
2. Lap belt	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Survival Kit Type	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
3. Inertia reel	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MKS-H Seat	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
4. G-Suit	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
5. Pressure suit-full or partial	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
6. Exposure suit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mark 5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
7. Flight suit (Other than above)	<input checked="" type="checkbox"/>	<input type="checkbox"/>		<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
8. Helmet	<input checked="" type="checkbox"/>	<input type="checkbox"/>	APH-5	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
9. Goggles/Eyeshield	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Tinted Visor	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
10. Shoes	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Iron age	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
11. Gloves	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Summer	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
12. Life vest	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MK-3C	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
13. Life raft	<input checked="" type="checkbox"/>	<input type="checkbox"/>	PK-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
14. OTHER:							
15. SIGNAL DEVICE - Flare (Night)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MCL3 MOD-0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
16. - Flare (Day)	<input checked="" type="checkbox"/>	<input type="checkbox"/>	MCL3 MOD-0	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
17. - Dye marker	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Sea Dive Marker	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
18. - Radio	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Corner Reflector	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
19. - Flashlight	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Mercury 761	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
20. - Mirror	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Signalling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
21. OTHER: (1) .38 cal. pistol			(2)				
22. SURVIVAL GEAR - Knife	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Survival	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
23. - First aid kit	<input checked="" type="checkbox"/>	<input type="checkbox"/>	PSK-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
24. - Shelter	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Poncho PK-2	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
25. - Food	<input checked="" type="checkbox"/>	<input type="checkbox"/>	LA Foot Packet	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
26. OTHER:							
27. RESCUE - Vehicle	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Destroyer & Helo	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
28. - Sling, Net, Stretcher	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Net	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	X	
29. OTHER: (1) Pistol .38 Cal.							

## SECTION G - DETAILED EQUIPMENT QUESTIONNAIRE

OXYGEN EQUIPMENT	1. MASK - MODEL OR TYPE A13-A	2. MODIFICATIONS, IF ANY Sierra Fittings (1)	
	3. REGULATOR - MODEL OR TYPE Bendix C-1 (6)	4. MODIFICATIONS, IF ANY	
RELEASE DEVICES	5. PREFLIGHTED BY USER <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	6. IF NO, WHY NOT	7. LIST DISCREPANCIES NOTED BY PREFLIGHT CHECK
	8. OXYGEN SUPPLY: 9 LITERS (Liquid)	TIME OF ACCIDENT P.S.I. (Gas) _____ LITERS (Liquid) _____ P.S.I. (Gas) _____	9. WAS OXYGEN IN USE AT TIME OF ACCID. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO
	10. IF YES, WAS SELECTOR SETTING <input checked="" type="checkbox"/> 100% <input type="checkbox"/> NORMAL	11. WAS ALL OXYGEN EQUIPMENT NECESSARY FOR THIS FLIGHT AVAILABLE? IF NO, LIST ITEMS AND REASON WHY. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO	
	12. WAS OXYGEN MADE REMOVED AT ANY TIME IN FLIGHT? IF YES, GIVE DURATION AND REASON. <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES		
	13. TYPE GLOVE RELEASE DEVICE Rocket Jet (1)	14. TYPE HARNESS RELEASE DEVICE Quick disconnect (1)	15. WHEN WERE RELEASE DEVICES ACTIVATED? N.A. (4)
	16. WERE DIFFICULTIES ENCOUNTERED WITH RELEASE DEVICE(S)? IF YES, STATE DIFFICULTIES, WHEN ENCOUNTERED AND CAUSE. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
	17. WERE DIFFICULTIES ENCOUNTERED AFTER ACTIVATING RELEASE DEVICE(S)? IF YES, STATE DIFFICULTIES, WHEN ENCOUNTERED AND CAUSE. <input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		
	18. WAS LIFE VEST INFLATED PRIOR TO ACTIVATING RELEASE DEVICE(S)? IF YES, WHAT DIFFICULTIES DID THIS PRODUCE? <input type="checkbox"/> YES <input type="checkbox"/> NO	N.A.	

## SEC. ON 8 - DETAILED EQUIPMENT QUESTIONNAIRE (Continued)

NAME OF INDIVIDUAL (Last, first, middle) (b) (6)				MODEL A/C <b>F-4B</b>
RESTRAINT HARNESS	19. INTEGRATED HARNESS SYSTEM, MODEL/TYPE <b>MA-2 (1)</b>	20. INTEGRATED? <input checked="" type="checkbox"/> FULL <input type="checkbox"/> PARTIAL	21. MODIFICATIONS, IF ANY STATE REASON <b>DUNEPS Aviation Clothing &amp; Survival Equip. Bulletin #12-62</b>	
	22. DID INTEGRATED HARNESS FIT PROPERLY? IF NO, LIST DISCREPANCIES IN FIT AND GIVE REASONS THEREFOR <input type="checkbox"/> NO <input checked="" type="checkbox"/> YES			
RESTRAINT HARNESS	23. INTEGRATED HARNESS FITTING WAS CONDUCTED BY: <input type="checkbox"/> WEARER <input type="checkbox"/> FLIGHT SURGEON <input checked="" type="checkbox"/> PARACHUTE RIGGER <input type="checkbox"/> AVIATION EQUIPMENT OFFICER <input type="checkbox"/> OTHER			
	24. IF SHOULDER HARNESS WAS USED, WAS IT: <input checked="" type="checkbox"/> LOCKED <input type="checkbox"/> UNLOCKED <input type="checkbox"/> TIGHT <input type="checkbox"/> BLACK <input type="checkbox"/> OTHER CONDITION			
HELMET	25. TYPE HELMET <b>AH-5</b>	26. LIST PRESCRIBED MODIFICATIONS <b>Sierra Fittings (1)</b>		
	27. OTHER MODIFICATIONS AND REASON FOR THEM <b>See Attached Sheet (5)</b>			
HELMET	28. HELMET FITTING WAS CONDUCTED BY: <input type="checkbox"/> WEARER <input type="checkbox"/> FLIGHT SURGEON <input checked="" type="checkbox"/> PARACHUTE RIGGER <input type="checkbox"/> AVIATION EQUIPMENT OFFICER <input type="checkbox"/> OTHER			
	29. TYPE CHUTE <b>HB 4004 PA (8)</b>	30. LAST PACKING DATE <b>1-5-63</b>	31. MODEL/TYPE BAILOUT OXYGEN <b>Scott Seat Kit (3)</b>	32. AUTOMATIC RIPCORD, IF INSTALLED (Model and type) <input checked="" type="checkbox"/> NONE (3)
PARACHUTE	33. DID AUTOMATIC RIPCORD FAIL IF YES, WHY? <input type="checkbox"/> NO <b>N.A.</b>		34. WAS RIPCORD ACTIVATION <input type="checkbox"/> MANUAL <input type="checkbox"/> AUTOMATIC	
	35. IF MANUALLY ACTIVATED STATE REASON AND ANY DIFFICULTIES ENCOUNTERED			
PARACHUTE	36. DID CHUTE OPEN IMMEDIATELY? IF NO, GIVE REASON <input type="checkbox"/> YES <input type="checkbox"/> NO		37. ALTITUDE THAT CHUTE OPENED FEET	
	38. OPENING SHOCK WAS: <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> SEVERE		39. BODY ATTITUDE AT OPENING	40. CONDITION OF CHUTE AFTER OPENING
PARACHUTE	41. CHUTE OSCILLATION PRESENT: <input type="checkbox"/> NONE <input type="checkbox"/> SLIGHT <input type="checkbox"/> MODERATE <input type="checkbox"/> SEVERE		42. IF OSCILLATION WAS PRESENT, HOW WAS IT STOPPED?	
	43. WEATHER CONDITIONS DURING DESCENT (List in sequence)			
PARACHUTE	44. TOPOGRAPHY OF LANDING SITE			
	45. WAS BAILOUT OXYGEN CONNECTED? <input type="checkbox"/> BEFORE EXIT <input type="checkbox"/> AFTER EXIT <input type="checkbox"/> NO <input type="checkbox"/> N.A.		46. WAS BAILOUT OXYGEN USED? IF NOT, WHY? <input type="checkbox"/> YES <input type="checkbox"/> NO	
PARACHUTE	47. WHEN WAS IT ACTIVATED? <input type="checkbox"/> BEFORE EXIT <input type="checkbox"/> AFTER EXIT		48. GIVE DIFFICULTIES ENCOUNTERED WITH BAILOUT OXYGEN AND THEIR CAUSE, IF ANY	
	49. WAS CHUTE HARNESS <input type="checkbox"/> TIGHT <input type="checkbox"/> SOFT <input type="checkbox"/> LOOSE		50. WAS A SITTING POSITION IN SLING OBTAINED DURING DESCENT? IF NOT, WHY? <input type="checkbox"/> NO <input type="checkbox"/> YES <input type="checkbox"/> NOT ATTEMPTED	
PARACHUTE	51. SEAT CUSHION IF PROVIDED (Model/Type) <input type="checkbox"/> NONE (6)		52. WAS PARACHUTE LANYARD CONNECTED TO LIFE VEST & BELT IF NOT, WHY? <input type="checkbox"/> NO <input type="checkbox"/> YES	
	53. LIST TYPE OF PARACHUTE TRAINING COMPLETED BY THIS INDIVIDUAL <input type="checkbox"/> NONE			
OTHER	54. IF ATTEMPT WAS MADE TO RELEASE PARACHUTE DURING DESCENT, WAS RELEASE ACTIVATED SUCCESSFULLY? <input type="checkbox"/> YES <input type="checkbox"/> NO		55. IF NO, GIVE REASON	
	56. IF G-SUIT, EXPOSURE SUIT, FULL OR PARTIAL PRESSURE SUIT WAS WORN, DID IT FIT PROPERLY? IF NOT, LIST DISCREPANCIES IN FIT AND GIVE REASONS THEREFOR. <input checked="" type="checkbox"/> YES <input type="checkbox"/> NO			
OTHER	57. WAS G-SUIT EQUIPPED WITH A SPRING-LOADED DISCONNECT ADAPTER? IF NO, GIVE REASON <input type="checkbox"/> YES <input type="checkbox"/> NO			
	58. LIST ALL ITEMS OF NON-STANDARD CLOTHING OR SURVIVAL EQUIPMENT UTILIZED			
OTHER	59. WAS ANY ITEM OF EQUIPMENT LOST? IF YES STATE ITEM, WHEN LOST, AND REASON FOR LOSS. <input checked="" type="checkbox"/> NO <input type="checkbox"/> YES		60. WAS ANY ITEM OF EQUIPMENT DISCARDED? IF YES, STATE ITEM, WHEN DISCARDED, AND REASON FOR DISCARD. <input type="checkbox"/> NO <input type="checkbox"/> YES	

**#27. MODIFICATIONS OF APH-5 HELMET**

- (a) BUAIR Aviation Clothing and Survival Equipment Bulletin #19-58.
- (b) BUAIR Aviation Clothing and Survival Equipment Bulletin #35-60.
- (c) BUAIR Aviation Clothing and Survival Equipment Bulletin #1-60.

## SECTION H - EMERGENCY EXIT FROM A/C AND SURVIVAL FACTORS

NAME OF INDIVIDUAL (Last, first, middle)

MODEL A/C

F-4B

(b) (6)

REMARKS

S	E	S-SUSPECTED, E-ESTABLISHED					
		1. EJECTION - Attempted					
		2. - Accomplished					
		3. - Through canopy					
YES	NO	EJECTION DIFFICULTIES ENCOUNTERED		IF YES, EXPLAIN DIFFICULTIES			
		4. - Prior to					
		5. - During					
		6. - Subsequent to					
		7. Give type and model of seat used					
		8. BAILOUT - Attempted					
		- Accomplished					
9. ALTITUDE AT TIME OF EXIT (feet)		10. ATTITUDE OR MANEUVER OF A/C AT EXIT OR IMPACT		11. AIR SPEED			
ABOVE SEA LEVEL _____		ABOVE TOPOGRAPHY _____					
12. COLLISION OF A/C WITH GROUND <input checked="" type="checkbox"/> WATER <input type="checkbox"/>		13. CONTROLLED? YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> UNKNOWN		14. POWER <input type="checkbox"/> ON <input checked="" type="checkbox"/> OFF	15. WHEELS <input type="checkbox"/> UP <input checked="" type="checkbox"/> DOWN (2)	16. FLAPS <input type="checkbox"/> FULL <input type="checkbox"/> UP <input type="checkbox"/> PARTIAL	
17. CANOPY POSITION AT EXIT OR IMPACT OPEN <input checked="" type="checkbox"/> CLOSED <input type="checkbox"/> JETTISONED		18. SEA STATE		19. AIR TEMP. 50 °F	20. WATER TEMP. °F	21. A/C FLOATED SEC.	22. TIME IN WATER
23. BAIL OUT OR COLLISION WITH WATER OR GROUND		24. EXIT USED		25. IS THIS THE RECOMMENDED EXIT? IF NO STATE REASON FOR CHOICE: YES <input type="checkbox"/> NO <input checked="" type="checkbox"/>			
26. DIFFICULTIES WITH THIS EXIT WERE IN REACHING <input type="checkbox"/> IN OPENING <input type="checkbox"/> IN EXITING <input type="checkbox"/>		27. STATE NATURE OF DIFFICULTY					
28. BODY POSITION DURING EXIT							
29. LIST OTHER FACTORS NOT INDICATED ABOVE WHICH Affected EXIT FROM A/C							

**SURVIVAL FACTORS:** Check factors below which are appropriate for this accident. Prepare a detailed narrative account of the factors checked below and attach to this form. Identify each item discussed by item number (e.g., H30, H31, etc.)

<b>COMMUNICATIONS:</b>		<b>MAINTAINING BODY TEMPERATURE:</b>	
30. Communicated position prior to mishap		50. Items used as shelter	
31. Witnesses at scene		51. Items used as clothing	
32. Electronic signal devices		52. Fire	
33. Visual signal devices		53. OTHER:	
34. Auditory signal devices		<b>ENVIRONMENTAL HAZARDS:</b>	
35. OTHER:		54. Exposure to natural forces	
<b>TRAVEL:</b>		55. Exposure to dangerous animals and plants	
36. LAND		56. Unfriendly native population	
37. WATER		57. OTHER:	
<b>SHELTER:</b>		<b>MORALE:</b>	
38. Life raft		58. Isolation	
39. Parachute		59. Psychological shock	
40. A/C structure		60. Lack of motivation to survive	
41. Natural shelter		61. Boredom	
42. Man-made shelter		62. Rationing, activities, and group coordination	
43. OTHER:		63. OTHER:	
<b>WATER SOURCE:</b>		<b>FOOD SOURCE:</b>	
44. Desalting kit, seawater or solar still		64. Prepared survival rations	
45. Rain, dew, snow, ice, etc.		65. Animals/plants	
46. Processed beverages		66. OTHER:	
47. Canteen, thermos, water breaker, etc.		<b>SURVIVAL TRAINING RECEIVED PRIOR TO MISHAP:</b>	
48. Streams, ponds, wells, etc.		(1) 67. See Attached Sheet	
49. OTHER:			

#67. SURVIVAL TRAINING.

- (1) Dilbert Dunker & Survival Training 8 Sept. 1960.
- (2) Martin Baker ejection seat indoctrination 19 Sept. 1960. Reviews on squadron level within past 60 days.
- (3) Pressure breathing in low pressure chamber at simulated 43,000 feet 19 Sept. 1960.
- (4) Full pressure suit indoctrination, explosive decompression at 70,000 feet.

MEDICAL OFFICER'S REPORT OF A/C ACCIDENT, INCIDENT, OR GROUND ACCIDENT - PAGE 6  
OPNAV FORM 3750-6E (Rev. 5-68)

OPNAV REPORT 3750-7

## SECTION I - PATHOLOGICAL FACTORS (Use A to denote ANTE MORTEM; P for POST MORTEM, when known and applicable.)

1. NAME OF INDIVIDUAL (Last, first, middle)				MODEL A/C
(b) (6)				F-4B

2. AGE	3. HEIGHT	4. WEIGHT	5. LOCATION AND DIRECTION FACING AT TIME OF ACCIDENT	6. INJURY CODE
(b) (6)	INCHES	(b) (6)	RIO Backseat, Martin Baker Seat	E

7. UNCONSCIOUSNESS			8. INTERNAL INJURIES (Non-fatal cases)		
<input type="checkbox"/> SHORT DURATION	<input type="checkbox"/> OTHER	LITTLE SIGNIFICANCE (give time)			

HEAD	9. CEREBRAL CONCUSSION				10. FACIAL INJURIES (a. e. c.)			11. INTRA-ORAL INJURIES		
	<input type="checkbox"/> MINOR	<input type="checkbox"/> SERIOUS	<input type="checkbox"/> CRITICAL	<input type="checkbox"/> FATAL						

INJURIES	12. MINOR EYE INJURIES				13. MAJOR EYE INJURIES					
	<input type="checkbox"/> RIGHT	<input type="checkbox"/> LEFT	<input type="checkbox"/> RIGHT	<input type="checkbox"/> LEFT						

14. TYPE OF FRACTURE	SKULL		VERTEBRAE (Specify Rx.)				SHOULDER GIRDLE	RIBS	PELVIS	UPPER ARM R L	LOWER ARM R L	HAND	UPPER LEG R L	LOWER LEG R L	FOOT
	CRA. /	FACIAL	CERV.	THOR.	LUMBAR	SACRAL									
SIMPLE															
COMPOUND															
COMMUNICATED															
DIS-LOCATION	JAW							SHOULDER	ELBOW	WRIST		HIP	KNEE	ANKLE	
											HAND				FOOT

15. AMPUTATIONS/AVULSIONS (State Parts)	16. LIST PRE-EXISTING PHYSICAL DEFECTS PRESENT AT TIME OF POST CRASH EXAMINATION
None	

17. SOFT TISSUE INJURIES	LACERATIONS			CONTUSION/SPRAIN/STRAIN			ABRASIONS			18. <input type="checkbox"/> DROWNS		
	MILD	MODERATE	SEVERE	MILD	MODERATE	SEVERE	MILD	MODERATE	SEVERE			
HEAD (V. e. f.)	VENTRAL									19. <input type="checkbox"/> ASPHYXIATED		
	DORSAL									20. SHOCK	21. EXPOSURE	
NECK										<input type="checkbox"/> MILD	<input type="checkbox"/> MILD	
THORAX	VENTRAL									<input type="checkbox"/> MODERATE	<input type="checkbox"/> MODERATE	
	DORSAL									<input type="checkbox"/> SEVERE	<input type="checkbox"/> SEVERE	
ABDOMEN	VENTRAL											
	DORSAL											
EXTREMITIES	UPPER											
	LOWER											
18.	DEGREE	1ST	2ND	3RD	1ST	2ND	3RD	1ST	2ND	3RD	22. EXTENT OF CARBONIZATION:	
<input type="checkbox"/> BURNS					<input type="checkbox"/> HEAD/ventral	<input type="checkbox"/> Dorsal	<input type="checkbox"/> TRUNK/ventral	<input type="checkbox"/> Dorsal	<input type="checkbox"/> ARMS	<input type="checkbox"/> LEGS	<input type="checkbox"/> NONE	<input type="checkbox"/> COMPLETE
<input type="checkbox"/> FROST BITE	AREA									ARE TISSUE SPECIMENS OBTAINABLE?	<input type="checkbox"/> YES	<input type="checkbox"/> NO

NOTE: Attach a detailed narrative account of injuries, cause, structures causing injury, magnitudes of force, and include whether ANTE- OR POST-MORTEM if determined. It is necessary to give as clear a picture of injury cause and sequence as possible.

24. ADMITTED TO SICK LIST? IF YES, GIVE DIAGNOSIS	25. DIAGNOSIS NO. (RAFMED P-2394)	26. ESTIMATED STAY ON SICK LIST
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO		DAYS

27. GROUNDED? IF YES GIVE REASON	28. ESTIMATED DURATION
<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO	DAYS

29. PRIMARY CAUSE OF DEATH (Use Basic Diagnostic Nomenclature, RAFMED P-2394)	30. SECONDARY CAUSE OF DEATH
NO. _____	NO. _____

31. AUTOPSY PERFORMED	32. PROTOCOL	33. WILL BE FURNISHED	34. AUTOPSY CONDUCTED BY	35. IF FLIGHT SURGEON DOES AUTOPSY USE "AUTOPSY GUIDE FOR A/C ACCIDENT FATALITIES", AFIP-1967.
<input type="checkbox"/> YES <input type="checkbox"/> NO	<input type="checkbox"/> ATTACHED	<input type="checkbox"/>	<input type="checkbox"/> PATHOLOGIST <input type="checkbox"/> FLIGHT SURGEON	

36. SPECIMEN	TEST PERFORMED	RESULTS	SPECIMEN	TEST PERFORMED	RESULTS
BLOOD:	1		TISSUE: (CNS)		
	2		- MUSCLE		
	3		- VISCERA		
URINE			OTHER:		
G.I. CONTENTS					

37. IF ULTRAVIOLET LIGHT OR OTHER SPECIALIZED INVESTIGATIVE PROCEDURES WERE USED AT THE MISHAP SITE OR AUTOPSY, LIST THEM IN THIS SPACE. FOR EACH ENTRY IN THIS SPACE A NARRATIVE ACCOUNT OF THEIR RESULTS AND INTERPRETATION WILL BE ATTACHED.